

19  
JANUARY-FEBRUARY 1946

# THE BULLETIN

OF THE



AMERICAN SOCIETY OF HOSPITAL PHARMACISTS

# American Society of Hospital Pharmacists

*Affiliated With The*  
**American Pharmaceutical Association**

## CONSTITUTION

Article I.—NAME. The name of this organization shall be The American Society of Hospital Pharmacists.

Article II.—OBJECTIVES. The objectives of the Society shall be to improve and extend the usefulness of the hospital pharmacist to the institution he serves, to the members of the other health professions with whom he is associated, and to the profession of pharmacy by:

FIRST—Establishing minimum standards of pharmaceutical service in hospitals, in order to provide benefits and protection for the public health which it will receive by the skill and art of qualified hospital pharmacists; and to insure for the future an adequate supply of such qualified hospital pharmacists by providing a standardized hospital training for four-year pharmacy graduates who have elected a specialized hospital pharmacy course.

SECOND — Providing for interchange of information among pharmacists by encouraging initiative in the development of new pharmaceutical techniques, and by maintaining a close pharmaceutical contact between hospital pharmacists and those engaged in general pharmaceutical practice.

THIRD—Aiding the medical profession in extending the economic and rational use of medicaments.

### Article III.—MEMBERSHIP

Section 1. (a)—ACTIVE MEMBERS of this Society shall be registered pharmacists in good professional standing, who are members of the American Pharmaceutical Association and whose practice has been essentially connected with hospitals, clinics and dispensaries for a period of one year.

(b) HONORARY MEMBERS may be elected from among the individuals who are especially interested in hospital practice. Honorary members shall not pay dues, nor shall they be eligible to vote or to hold office.

(c) ASSOCIATE MEMBERS may be elected from among individuals other than hospital pharmacists, who, by their work in the health services, the teaching of prospective hospital pharmacists, or otherwise contributing to hospital pharmacy, make themselves eligible to membership. Associate members shall not be entitled to hold office or to vote. Associate members should be members of the American Pharmaceutical Association.

Section 2.—Applications for membership shall be received by the Committee on Membership and shall be acted upon by the Executive Committee on the recommendation of said Committee on Membership.

Article IV.—OFFICERS. The officers of this Society shall be a Chairman, a Vice-chairman, a Secretary, and a Treasurer, all of whom shall be elected annually, and none of whom, with the exception of the Secretary and Treasurer, may hold office for more than two consecutive terms.

Article V.—AMENDMENTS. Every proposition to alter or amend this Constitution shall be made by two members at an annual meeting of the Society and shall be voted upon by ballot of the members of the Society by mail at least one month subsequent to the annual meeting. All ballots to be eligible for voting must be post-marked within thirty (30) days of the date of the ballot.

## BY - LAWS

Chapter I.—ELECTION OF OFFICERS. At the first session of each annual meeting of this Society, the Chairman shall appoint a committee of three members who shall submit nominations for each office of the Society for the ensuing year. The Committee shall present its nominations at the final session of the annual meeting at which time additional nominations may be made from the floor. They shall be voted upon by ballot of the members of the Society by mail at least one month subsequent to the annual meeting. All ballots to be eligible for voting must be post-marked within thirty (30) days of the date of the ballot. A majority of such votes cast shall constitute election.

### Chapter II.—DUTIES OF OFFICERS:

Article 1.—CHAIRMAN and VICE-CHAIRMAN. The Chairman, or in his absence, the Vice-chairman, shall preside at all meetings. He will appoint all committees not otherwise provided for and shall be ex-officio member of all committees. He shall prepare a Chairman's address to be presented at the first session of the annual meeting of the Society following his installation.

Article 2.—SECRETARY. The Secretary shall keep minutes of the sessions of the Society and maintain a roll of its members. He shall notify individuals of their appointment to committees, notify members of the time and place of all meetings, and conduct the correspondence of the Society. He shall present a written report of his work to the annual meeting of the Society. He shall collect the dues of the members.

Article 3.—TREASURER. The Treasurer shall receive and keep account of all moneys received by the Society in the form of dues or remittances and shall disburse them at the direction of the Executive Committee or at the direction of the Finance Committee.

Chapter III.—EXECUTIVE COMMITTEE. The Executive Committee shall consist of the Officers of the Society and the Chairman of each standing committee. It shall meet on the call of the Chairman of the Society, shall have supervision over the expenditure of all funds of the Society, and shall be empowered to act for the Society during the period between annual meetings.

Chapter IV.—FINANCES. The membership dues of this Society shall be three dollars (\$3.00) per year, payable January first of each year. Accepted regional groups consisting of twenty (20) or more members, or local groups consisting of ten (10) or more members shall collect dues for the American Society of Hospital Pharmacists. These groups may apply to the Executive Committee for refund in the amount of one dollar (\$1.00) per year for each active or associate member. Refunds shall be paid within sixty (60) days after payment to the American Society of Hospital Pharmacists. This amendment is retroactive to January first, 1944.

Chapter V.—STANDING COMMITTEES. There shall be five standing committees of the Society; each consisting of three members appointed by the Chairman of the Society, with the approval of the Executive Committee.

**Continued inside back cover.**

Chemistry  
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# THE BULLETIN

OF THE



VOLUME 3 - JANUARY-FEBRUARY, 1946 - NO. 1

THE BULLETIN is published bimonthly by the American Society of Hospital Pharmacists, a national organization devoted to the profession of hospital pharmacy, dedicated to the interests of the hospital pharmacist, and pledged to co-operate with the American Pharmaceutical Association with which it is affiliated.

Contributions of articles by hospital pharmacists, or by others interested in the progress of this important branch of the public health profession, will be accepted if they are of general interest to the hospital pharmacist. The editors reserve the right to revise all material submitted, if necessary.

Manuscripts submitted for publication should be typewritten in double spacing on one side of paper 8 1/2 x 11". Whenever possible a photograph, drawing, or printed form to illustrate the topic that is discussed in the article should be included.

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American Society of Hospital Pharmacists

A.P.H.





# Correspondence



Sirs: Enclosed please find check for three dollars, 1946 dues for the American Society of Hospital Pharmacists. It gives me a great deal of pleasure to look forward to another year of *THE BULLETIN*. I have enjoyed each issue so much and find a great deal of useful and practical information. A tuberculosis hospital is not as wide in scope for a pharmacist but its particular problems are interesting. Vitamins and iron are used unstintingly.

I notice only one other pharmacist from Oregon in the membership list and wonder why the hospitals aren't more interested.

(Miss) Zennie Stauffer

State T. B. Hospital  
Salem, Oregon

Sirs: I read the announcement of the Institute on Hospital Pharmacy in *THE BULLETIN* of the A.S.H.P. and am very anxious to attend. I am interested in manufacturing, especially parenteral medications. I think it will be a splendid opportunity for us who have so many common problems to be able to discuss and learn new things. Having been off duty because of illness for the greater of two years, I feel the need for this sort of thing very keenly. Since there are so many changes, new drugs and new treatments, it will be of great value. Any information you may be able to give as to costs, maintenance, etc., I would appreciate.

Sister M. Raphael

St. Vincent's Hospital  
Sioux City, Iowa

The Institute on Hospital Pharmacy will be held at the University Hospital, Ann Arbor, Michigan, July 15 - 19 inclusive. The fee for the institute will be \$25 which will not include room or meals. Registration and rooming accommodations for the institute will be handled by Dr. Hugo V. Hullerman, secretary of the Council on Professional Practice, American Hospital Association, 18 East Division Street, Chicago 10. As soon as the programs and application forms are available they will be sent to each member of the Society. Attendance will be necessarily limited to approximately 120. Applications will be accepted in the order of their arrival accompanied by tuition check. Adequate rooming accommodations will be available for Sisters as well as others attending the institute.

Sirs: I have intended writing to you for some time to tell you, my dear husband, Herbert Skinner, died on December 30, 1944. His death was quite sudden though he had been suffering from heart trouble for some little time.

He would have been deeply interested in the particulars of the American Society of Hospital Pharmacists you sent him and the great developments reported, and you will probably have been expecting to hear from him.

I, myself, am very interested in your letter as I have been associated with hospital pharmacy for a good many years. One of the points that strikes me as most helpful is your affiliation with the American Pharmaceutical Association. *THE BULLETIN* gives much useful and interesting material and I am sure it must be of great service to your members.

Should I have the opportunity of visiting the States again, I shall hope to contact some of your members.

I was over with my husband in 1937. With all good wishes for the future development of the American Society of Hospital Pharmacists.

Henrietta E. Skinner, M.P.S.  
Pharmaceutical Society of Great Britain  
London, England

Sirs: We have received an inquiry from a former student of ours for a formula for Derrieux's Solution. We have been unable to find anything on it here, and would appreciate any help you might be able to give us.

Richard H. Mattern

Falk Clinic  
Pittsburgh, Pennsylvania

The formula for Derrieux's Solution has not been found to date. Perhaps other hospital pharmacists have information about this solution. Please write to the editor of if you have a reply.

Sirs: I am a member of the A.Ph.A. - dues paid for 1946, and am enclosing check for three dollars to cover dues in A.S.H.P. for 1946.

I have thoroughly enjoyed *THE BULLETIN* and in reading the November-December issue see that the cost is above the present budget. I for one should be willing to pay extra to be assured of receiving it in the future. Also, I think the idea of accepting advertising to help finance it is good, but certainly do not feel it will add to my interest in it.

Although I have been a registered, practicing pharmacist since 1937, I have just completed my first year as a hospital pharmacist and am completely sold on it.

I am in full charge of purchasing and dispensing. We have 110 beds and 35 bassinets and at present are building an additional 45 rooms, as well as a complete new central plant to accommodate a 310 bed hospital.

Elmhurst Community Hospital  
Elmhurst, Illinois

L. C. Klemme





# EDITORIAL

The people of Pennsylvania are now assured the same protection and competence in the preparation and dispensing of their drugs and medicines when they enter a hospital as when they have their prescriptions filled at the corner drug store. A recent ruling of the Attorney-General of that state held that hospital pharmacies must register with and obtain a permit from the Pennsylvania Board of Pharmacy, must be under the supervision of a registered pharmacist and are amendable to all provisions of the state pharmacy act. The public, the profession of pharmacy, and especially hospital pharmacy should be grateful indeed to Secretary William Goodyear of the Pennsylvania Board of Pharmacy for his foresight in requesting an opinion on this important subject.

We may now infer that since hospital pharmacies in Pennsylvania are required to comply with the state pharmacy laws there will be no question that those serving an apprenticeship in these pharmacies may have their experience approved by the state Board of Pharmacy.

The Pennsylvania Board of Pharmacy is one of the few boards which has accepted its responsibility as a public health agency and has taken definite steps to insure competent pharmacy care for citizens of the state at the time they need it most, when they are sick and hospitalized.

The preparation and dispensing of medicinals requires professional supervision. Boards of pharmacy have an obligation to the public to insure this supervision. For years we have been amazed at the general disregard and lax attitude taken toward the enforcement of the pharmacy law as it pertains to hospitals. While there have been definite educational and legal requirements for the handling of drugs and medicines in the retail drug store, the hospital pharmacy has been open to all without regard to qualification, education or background of experience. In 1944, while there were over 6600 hospitals in the United States, there were only 4200 full-time and part-time hospital pharmacists. Since we know that many hospitals have more than one pharmacist we can estimate that only about one-half of the Nation's hospitals employ a registered pharmacist to compound and dispense drugs.

Indiana is another state which, through a recent act of its State Board of Health, has ruled that hospital pharmacies must comply with provisions of the state pharmacy law requiring registration of drug stores and pharmacies. California requires similar compliance. We hope there are others. We hope, too, that in the near future other state boards of pharmacy will take similar action.

American Society of Hospital Pharmacists  
AFFILIATED WITH THE  
AMERICAN PHARMACEUTICAL ASSOCIATION  
February 25, 1946

To All Hospital Pharmacists:

Ten years ago, around a breakfast table at the meeting of the American Pharmaceutical Association in Dallas, Texas, sat a handful of people with a common interest, hospital pharmacy. It was then that the American Society of Hospital Pharmacists had its inception, later becoming an integral part of the American Pharmaceutical Association.

The American Society of Hospital Pharmacists is the only organization in America exclusively devoted to the interests of the hospital pharmacist. Each member has a part in the work the society is doing for hospital pharmacy. Our members are proud of this and have an attitude toward their profession which the non-member never possesses. Hospital administrators are beginning to recognize this and to judge individuals accordingly. If you wish to be considered pharmaceutically progressive, identify yourself with the organizations whose united efforts give strength to American pharmacists.

The following objectives have been set up by the society:

1. Establishing minimum standards of pharmaceutical service in hospitals, in order to provide benefits and protection for the public health through the skill and art of qualified hospital pharmacists; and to insure for the future an adequate supply of such qualified hospital pharmacists by providing a standardized hospital training for four-year pharmacy graduates who have elected a specialized hospital pharmacy course.

2. Providing for interchange of information among pharmacists by encouraging initiative in the development of new pharmaceutical techniques, and by maintaining a close pharmaceutical contact between hospital pharmacists and those engaged in general pharmaceutical practice.
3. Aiding the medical profession in extending the economic and rational use of medicaments.

The membership committee extends to you an invitation for active membership. Won't you fill out the application blanks on the back cover of The Bulletin and forward to I.T. Reamer, Secretary, Duke Hospital, Durham, North Carolina?

Sincerely yours,

*Geraldine J. Stockert*  
Geraldine J. Stockert, Chairman  
Membership Committee



*An Invitation*

*by*

*Geraldine J. Stockert*

## *Announcement*

THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS ANNOUNCES CASH PRIZE AWARDS FOR THE BEST UNPUBLISHED CONTRIBUTIONS ON HOSPITAL PHARMACY OR ALLIED SUBJECTS. THE CONTEST IS OPEN TO HOSPITAL PHARMACISTS OF THE UNITED STATES, ITS TERRITORIES AND POSSESSIONS, AND THE DOMINION OF CANADA. THERE WILL BE THREE AWARDS: \$50 AS FIRST PRIZE, \$25 AS SECOND PRIZE AND \$25 AS THIRD PRIZE.

THE SUBJECT MATTER IS NECESSARILY BROAD. THE MANUSCRIPT MAY DEAL WITH SUGGESTED LONG RANGE POLICIES AND PLANS FOR HOSPITAL PHARMACY. THESE MAY BE DISCUSSED FROM THE STANDPOINT OF HOSPITAL PHARMACY IN THE INDIVIDUAL INSTITUTION, LOCAL OR STATE ACTIVITY, NATIONAL PLANS, EDUCATIONAL PROGRAMS, LEGISLATIVE OBJECTIVES, OR ANY OTHER THEME ON HOSPITAL PHARMACY THE WRITER MAY SELECT.

THE JURY WILL BE COMPRISED OF GLENN L. JENKINS, DEAN OF THE COLLEGE OF PHARMACY, PURDUE UNIVERSITY; IVOR GRIFFITH, DEAN OF THE PHILADELPHIA COLLEGE OF PHARMACY AND ALLIED SCIENCES; TROY C. DANIELS, DEAN OF THE COLLEGE OF PHARMACY, UNIVERSITY OF CALIFORNIA, ROBERT P. FISCHER, SECRETARY OF THE AMERICAN PHARMACEUTICAL ASSOCIATION; SISTER MARY ETHELDREDRA, CHIEF PHARMACIST AT SAINT MARY'S HOSPITAL, BROOKLYN; DON E. FRANCKE, CHAIRMAN, AMERICAN SOCIETY OF HOSPITAL PHARMACISTS; AND GLORIA F. NIEMEYER, ASSOCIATE EDITOR, THE BULLETIN.

ALL ENTRIES SHOULD BE LIMITED TO 5,000 WORDS, BE TYPEWRITTEN IN ENGLISH, PREPARED IN MANUSCRIPT FORM, SUBMITTED IN TRIPLICATE, AND MAILED FOR RECEIPT NOT LATER THAN JULY FIRST, 1946. ENTRIES SHOULD BE ADDRESSED TO THE EDITOR, THE BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, 1313 ANN STREET, ANN ARBOR, MICHIGAN. ALL ENTRIES SUBMITTED BECOME THE PROPERTY OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS AND THE SOCIETY RESERVES THE RIGHT TO PUBLISH THEM, OR TO RELEASE THEM FOR PUBLICATION IN OTHER JOURNALS. NO ENTRIES WILL BE RETURNED.



# BENADRYL

By Don E. Francke

With the discovery of benadryl research workers have found an effective drug to overcome the pharmacological effects of histamine - believed to be responsible for the symptoms of several of man's most troublesome diseases. This new drug finds its field of greatest usefulness in diseases related to allergy - many of which in turn are believed to be caused by the release of histamine in the body.

Among the conditions in which benadryl is employed are acute and chronic urticaria, seasonal hay fever, vasomotor rhinitis, bronchial asthma and serum reactions. All of these conditions are thought to be associated in some manner with the release of histamine or a histamine-like substance. Benadryl is a specific antihistamine drug which overcomes the actions of histamine. Benadryl has now been released by Parke Davis and Company in 50 mg. capsules and in an elixir containing 10 mg. per 4 cc.

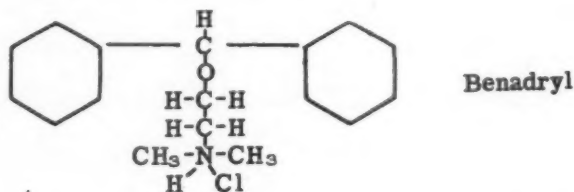
Histamine has several important actions believed to be involved in urticaria, seasonal hay fever, bronchial asthma, drug allergy, vasomotor rhinitis and other conditions. Dilation and increased permeability of the capillaries of the skin and mucous membranes are important pharmacological actions of histamine. Increased capillary permeability results in a seepage of fluid through the capillary walls producing localized edema which, together with erythema and pruritus constitute the principal symptoms of urticaria. A second important action of histamine is contraction of the smooth muscles of the bronchi, blood vessels, intestines and uterus. Histamine also acts as a secretagogue, stimulating the lacrimal, nasal, pulmonary and digestive secretions. In the skin histamine acts on the cutaneous endings of pain nerves to produce pain.

Benadryl possesses several advantages over other drugs traditionally used to treat these conditions. Epinephrine and ephedrine have long been used in the therapy of hay fever, urticaria, bronchial asthma, vasomotor rhinitis and serum reactions. In many of these conditions the results obtained were not too satisfactory. Although

## A SUMMARY OF THE CURRENT AVAILABLE LITERATURE ON A NOVEL ANTIHISTAMINE DRUG PRESENTED FOR THE INFORMATION OF HOSPITAL PHARMACISTS.

benadryl is not the perfect answer to the treatment of all these conditions, nevertheless, results in many cases have been encouraging and in others dramatic. Among the advantages of benadryl are: it may be given orally or by injection, it does not bring about an increase in blood pressure, does not stimulate the heart, is not a central nervous system stimulant and it appears to have a low order of toxicity. Its principal disadvantages are the occasional appearance of drowsiness, dizziness, dry mouth, or nervousness.

Endeavoring to find a new drug with a potent antihistamine action, Loew, Kaiser and Moore<sup>6</sup> working in the research laboratories of Parke Davis and Company were testing a series of synthetic compounds. In studying the compounds they measured the degree of protection each drug gave against bronchospasm induced in guinea pigs by the inhalation of a nebulized histamine solution. Of the twenty-one compounds studied benadryl showed the most promise. Known chemically as beta dimethylaminoethyl benzhydrol ether hydrochloride, benadryl is a white crystalline water soluble substance which is stable under ordinary conditions of temperature and pressure.



### PHARMACOLOGY

The experimental work of Loew<sup>6,7,8</sup> and his coworkers on animals suggests that benadryl has three important pharmacological actions. It alleviates bronchial constriction caused by histamine and by anaphylactic shock. It antagonizes the spasm of smooth muscles. It prevents or overcomes the vasodepressor effects of histamine. Thus benadryl destroys, counteracts, blocks or otherwise prevents some of the actions of histamine. In doing so it relieves many of the condi-

tions caused by the release of histamine or a histamine-like substance.

In relieving histamine induced bronchial constriction, benadryl was found to be from 15 to 30 times as effective as aminophylline. When the antispasmodic action of benadryl was compared to that of papaverine it was found that benadryl was 650 times as effective in antagonizing histamine, 50 times as effective in antagonizing acetylcholine, and 1.3 times as effective in antagonizing the contractile effects of barium chloride. These results indicate that the antispasmodic action of benadryl is not a separate entity but, rather, is made up of at least three components. Effective antispasmodic drugs in order of their decreasing potency were found to be: epinephrine, benadryl, demerol, atropine, papaverine, and aminophylline.

Further evidence that benadryl is an antihistamine drug is offered by studies<sup>10</sup> showing that the compound decreases the cutaneous vasodilating action of histamine and also alleviates the nasal congestion induced by histamine. The shrinkage of mucous membranes in hay fever and the disappearance of wheals from the skin in urticaria may be due to the antihistamine effects of benadryl on blood vessels.<sup>1</sup>

Both gastric secretion and gastric volume produced in response to the administration of histamine may be reduced. It is interesting to note that the effect of benadryl on gastric secretion has suggested<sup>10</sup> a new approach to the control of gastric acidity, employing benadryl or some other antihistamine drug to inhibit gastric secretion. The action of benadryl in drying up the secretions of hay fever may be due to blocking of the secretagogue actions of histamine.

Benadryl is thought to act by competing with histamine for a given site of action or receptive substance. If benadryl combines with the receptive substance no reaction occurs, but histamine is thereby prevented from combining with the same site and its physiologic action thereby obviated.<sup>1,3</sup>

#### INDICATIONS

Urticaria or hives are due to an increased permeability of the superficial blood vessels of the skin caused by a sudden escape of fluid through the vessel walls, resulting in localized edema. Acute urticaria may subside spontaneously in a relatively short period of time, whereas chronic urticaria may persist for years. Although seldom dangerous unless the larynx or upper trachea is

involved, urticaria may be incapacitating especially if the hands or feet are affected, while the accompanying pruritus makes the condition an unpleasant one.

#### Urticaria

First to report on the clinical uses of benadryl were Curtis and Owens<sup>2</sup> who administered the drug orally in doses of from 50 to 100 mg. one to five times a day to a group of 18 patients with acute and chronic urticaria. Eleven patients experienced prompt relief of symptoms, 3 had definite and real improvement while 4 were not benefited. The authors emphasize that the drug is a palliative; in many patients the urticaria recurred when the administration of the drug was discontinued. No cumulative toxic symptoms were noted in patients who ingested the drug for as long as six or seven months. All toxic symptoms promptly disappeared when the drug was discontinued.

Reporting more fully on their cases in a later article<sup>3</sup> Curtis and Owens give several case histories which exemplify the results obtained in the treatment of urticaria with benadryl.

W. W., a 40 year old woman (private patient), gave a six months' history of giant urticaria and angioneurotic edema on Nov. 1, 1944. Many drugs and elimination diets were tried without effect. For one month the urticaria disappeared and did not recur when she took 50 mg. of Benadryl four times a day, but a few wheals would reappear if she took only 50 mg. three times a day. Use of the drug was then discontinued for three weeks, with recurrence of the lesions. Resumption of Benadryl was followed by complete relief, but she required 50 mg. five times daily. No reaction to the drug occurred.

M. F., a 22 year old man (private patient), presented himself on Feb. 20, 1945, with a two months' history of urticaria. One or two lesions appeared at any site on the body and lasted for two or three days. He was never free of lesions. The initial dose of Benadryl, 50 mg., was followed by disappearance of the urticaria in one hour. Fifty milligrams three times a day was administered for seven days, during which time no lesions appeared. Administration of the drug was discontinued, and in two days several pruritic urticaria appeared. Benadryl, 50 mg. twice a day and then 50 mg. daily, was administered, with no urticarial lesions appearing in eight days. Drowsiness and muscular soreness were present while the drug was ingested, but the patient was able to take the one dose at night and the toxic symptoms subsided by the time he arose in the morning.

In another series of patients with urticaria O'Leary and Farber<sup>11</sup> describe the results with benadryl therapy as "so consistent and so dramatic that recitation of case histories would be repetitious..."

Similar results by the use of benadryl in urticaria were obtained by Shaffer, Carrick and Zackheim<sup>12</sup>. In the 1 case of lichen urticatus treated with benadryl by these authors, the pruritus and an iris-like lesion on the face disappeared

completely after the patient had taken six 50 mg. capsules of the drug over a period of two days. Encouraging, but not startling results were obtained by the use of the drug in various types of eczema; the eczema and pruritus were improved in 2 cases, while in 2 cases the drug was of no value.

Using benadryl before skin testing certain patients who presented the obstacle of dermographic whealing which interfered with the interpretation of the skin test, Feinberg and Friedlaender<sup>4</sup> found that the drug either partially or completely inhibited the dermographic whealing. For this purpose the patients were instructed to take 50 mg. of the drug five hours, three hours, and one hour before the skin tests were to be made. In exceptional cases larger doses were employed. In 18 of the 30 cases studied positive atopic skin reactions were demonstrated after the dermographism was controlled.

#### Bronchial Asthma and Hay Fever

Much better results are obtained in treating hay fever with benadryl than by the use of the same chemical in bronchial asthma. Administering an oral dosage of 50 to 100 mg. three times daily to patients with hay fever alone, Koelsche, Prickman and Carryer,<sup>5</sup> obtained benefit (50 per cent or more relief) in 75 per cent of their cases while 25 per cent were not helped. The beneficial effects noted were cessation of nasal discharge and relief of the irritated feeling in the nose and eyes. In those patients in whom bronchial asthma was associated with hay fever 75 per cent were benefited while 26 per cent were not relieved. In those cases with bronchial asthma alone 33 per cent of the cases were benefited while 67 per cent were not improved.

In a series of cases of seasonal hay fever with typical symptoms of nasal congestion, rhinorrhea, sneezing, itching of the nose and eyes, lacrimation and occasional cough reported by McElin and Horton<sup>10</sup> at least 50 per cent relief was obtained in 21 of the 22 cases, while at least 75 per cent relief was obtained in 19 of the 22 cases.

Administering benadryl in the form of capsules and an elixir to 12 children with seasonal hay fever, Logan<sup>9</sup> reported good or excellent results in 9 cases, fair in 1, questionable in 1 and no effect in 1.

#### Drug Allergy

Using the drug intravenously McElin and Horton<sup>10</sup> found benadryl very effective in relieving

3 cases of acute urticaria and edema developing from a reaction to the intramuscular injection of penicillin. In all 3 cases the patients experienced relief within five minutes after the injection. In 1 case of drug allergy to the barbiturates, relief was obtained in two minutes after the injection of benadryl. A case of serum reaction with generalized urticaria in a child following the administration of tetanus-gas gangrene antitoxin was successfully treated by benadryl. The sensitivity to small changes in dosage of benadryl is emphasized by this case in which the administration of 20 mg. failed to produce any effect while a dose of 30 mg. was followed by a prompt favorable effect.<sup>9</sup>

#### Vasomotor Rhinitis

The release of histamine is thought to be a factor also in vasomotor rhinitis, myalgia or "sinus headache," and in Meniere's disease. Of these, vasomotor rhinitis seems to respond better to treatment with benadryl. Williams<sup>14</sup> reported a series of 12 cases of vasomotor rhinitis, 19 of whom obtained 90 per cent relief, while 2 obtained no relief. Four cases with severe continuous perennial vasomotor rhinitis, some with polypoid tissue and purulent discharge (hyperplastic ethmoiditis) showed marked symptomatic relief with retraction or disappearance of polypoid and a decrease or disappearance of the purulent discharge. However, when benadryl was discontinued, the symptoms tended to return within twelve hours in all cases.

Treating 2 cases of vasomotor rhinitis in children Logan<sup>9</sup> reported immediate good results in 1 case; the second case also benefited from benadryl after the dosage was increased.

Five cases of sinus headache treated at alternate weeks with benadryl and niacin responded better to niacin than to benadryl. Two cases of Meniere's disease showed 75 to 80 per cent relief of symptoms with benadryl. However, greater relief was obtained when a combination of niacin, potassium nitrate and benadryl was used.<sup>14</sup>

#### DOSAGE AND ADMINISTRATION

That benadryl is a palliative and not a cure is a point emphasized by all authors cited; symptoms were controlled only as long as the drug was continued and promptly recurred when benadryl was discontinued. A second consideration established by many of the writers is that oftentimes a poor response to the drug is due to inadequate dosage. For example Curtis and Owens<sup>3</sup> found that in 1 case while 50 mg. administered three times a day afforded no relief, the use of



100 mg. three times a day was followed by definite improvement in 36 hours. In another patient the same authors report that 50 mg. given three times a day afforded only partial relief while the same dose given four times a day gave complete relief.

Benadryl may be given orally or by injection. For oral use it is available in 50 mg. capsules and in the form of an elixir containing 10 mg. in 4 cc. Since intramuscular injection is followed often by irritation, benadryl is usually injected intravenously in a solution containing 60 mg of the drug dissolved in 100 cc of sterile physiological saline. From 10 to 120 mg. has been given by continuous intravenous drip within a ten minute period.

The usual oral adult dosage is 50 mg. given three to four times a day, although 100 mg. given three to five times a day has been found necessary in some cases. The dosage for children is from 30 to 100 mg. daily in divided doses. Logan<sup>9</sup> suggests that a child be given 2 mg. per pound of body weight in two to four divided doses daily.

The onset and duration of action varies with the route of administration, the condition being treated and the response of the individual patient. After intravenous injection the onset of action varies from thirty seconds to five minutes. Administered orally benadryl elicits a response usually in from twenty to sixty minutes. The

duration of action after oral administration varies from two to eight hours.

### TOXICITY AND SIDE EFFECTS

Benadryl is a drug of low toxicity. Death occurs in 50 per cent of albino mice after an oral dose of 167 mg. per kilogram and in albino rats after 545 mg. per kilogram. Violent excitement, convulsions, respiratory failure and death resulted in from a few minutes to several hours after the administration of lethal doses. Excitement and ataxia with recovery in one to two hours occurred after nonlethal toxic doses.<sup>3</sup>

The principal side effects noted after the administration of benadryl are sleepiness, dizziness, muscular aching, weakness, dry mouth and nervousness. Of these sleepiness and dizziness occur most often. The concurrent administration of 25 mg. of ephedrine sulfate will in some cases overcome sleepiness. In some patients with drowsiness the side-effect disappeared after the drug had been taken several days and in other patients a reduction in dosage lessened the drowsiness. Most of the patients manifesting signs of intolerance were receiving 100 mg. of the drug three to four times a day, while those receiving 50 mg. three to four times a day complained of only mild reactions. That the drug possesses a local anesthetic action is shown by the fact that when benadryl elixir is held in the mouth a short time anesthesia of the tongue develops.

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# Therapeutic Trends



New Trends In Medicine And Pharmacy Include FOLIC ACID - B A L - PHTHALYLSULFATHIAZOLE BACITRACIN-AMIGEN FOR STOMACH ULCERS - CARBON 13 - PROPYL THIOURACIL.

## B A L

British Anti-Lewisite, commonly known as B A L, may prove valuable in medicine as an anti-arsenic chemical. Patients with arsenical dermatitis, arsenical encephalitis, and individuals who have received a massive overdose of mapharsen during the arsenotherapy of syphilis, have been effectively treated with B A L according to a report in *Science*, volume 102, December 14, 1945.

Discovered in England during the war, B A L was found to be valuable in treating poisoning resulting from arsenicals such as lewisite gas used in chemical warfare. Later, experiments were carried out in the United States to evaluate the therapeutic applications of B A L. Chemically, it is an alcohol (2, 3 dithiopropanol). B A L is not an innocuous substance. Rapid intravenous injection of large doses of B A L is followed by circulatory collapse. A local erythema and edema of the skin is caused by B A L upon local application. Dilutions as low as 5-10 per cent are therapeutically active and may be applied to the eye or injected intramuscularly with no lasting ill effects. In addition to the use of B A L in systemic arsenical poisoning, it shows encouraging results in mercury poisoning.

## AMIGEN FOR STOMACH ULCERS

A treatment for stomach ulcers involving frequent feeding with Amigen, a predigested protein, has been reported by Co Tui and his co-workers at New York University in a recent *Journal of the American Medical Association*. Though ulcers were relieved in two to three weeks the treatment, they pointed out, does not insure against recurrence of symptoms when the patient reverts to old dietary habits.

Utilization of predigested protein containing amino acids known to be essential to life, has proved valuable in convalescence after stomach operations and nutritional deficiencies. It was during these studies that the value of the high feeding treatment was first suspected when four patients who were to be operated on for stomach ulcer were given the treatment primarily to prepare them for operation. All four were relieved in twenty-four hours and all gained an average of a pound a day in the first eight to ten days. Twenty-six patients have been given the treatment in the past year and in all the results have been successful.

Prompt improvement in treating ulcers with amigen appears to be due to the protein hydrolysate, which is simultaneously an antacid and an easily assimilable food which can be built into the tissue. Further studies will be carried out to determine the therapeutic value of amino acid feeding in the treatment of stomach ulcers.

## PROPYL DERIVATIVE OF THIOURACIL

A propyl derivative of thiouracil may soon be available. Although it is just as toxic as thiouracil it is said to be five times as effective and hence may be used in smaller dosage. The dose of the propyl derivative of thiouracil is in the range of 50 milligrams a day.

### PHTHALYLSULFATHIAZOLE

Use of a new sulfa compound known as phthalyl-sulfathiazole or sulfathalidine has proved advantageous over the other sulfonamides used in the treatment of infectious diseases of the colon. The percentage of reported "good" results, the lack of mortality and the absence of toxicity of the drug exceed the best results published to date according to the Journal of the American Medical Association in a report by Michael H. Striecher, M.D. University of Illinois College of Medicine.

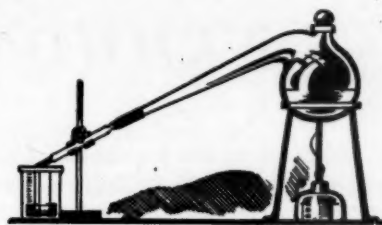
Similar to succinylsulfathiazole chemically and therapeutically, but more effective, sulfathalidine can be administered in smaller doses to an advantage and is rapidly excreted in the urine. Few toxic symptoms have been observed since sulfathalidine is absorbed sparingly from the gastrointestinal tract and maintains low concentrations in the blood.

Though evaluation of sulfathalidine cannot be made at the present time, further studies will be carried out to determine the future of this new sulfonamide.

### CARBON 13

Research work with the isotope of ordinary carbon, commonly known as carbon 13 or heavy carbon indicates that this new radioactive element may aid medical science as a tracer substance in studying the secrets of metabolic diseases. Though carbon 13 has been produced in limited quantities up to this time, it will probably be available for research in larger amounts in the near future.

In experimental studies, carbon 13 has been used to determine how fats are broken down in living cells, to determine how sugars are oxidized and the effect insulin has on these reactions, and to trace the effects of vitamins and the chemical reactions in which they participate. As a result of this work it is also believed that other radioactive isotopes might be someday used as a treatment for cancer. A committee has been organized with the purpose of sponsoring a nation-wide biological, biochemical and chemical research with isotopes of carbon and other elements.



### FOLIC ACID

Synthetic folic acid (*Lactobacillus casei* factor) was shown by Tom Spies, M. D. Birmingham, Alabama, to have a striking anti-anemic effect in five types of macrocytic anemia including Addisonian pernicious anemia, nutritional macrocytic anemia, and the macrocytic anemia of spur, pellagra and pregnancy. Making studies on patients having sprue, a disease in which macrocytic anemia occurs, Spies and his associates found that a significant hemopoietic response followed the administration of folic acid. In the experimental studies folic acid was administered intravenously, intramuscularly and orally in doses of 50 to 200 milligrams. Treatment was followed by a general upsurge of well-being by the patient with an increase in appetite, strength and vigor. The response to treatment with folic acid paralleled those afforded by potent liver extract.

### BACITRACIN

Bacitracin a new antibiotic, has proved effective against a wide range of pathogenic organisms including pus-forming and blood poisoning streptococci, staphylococci, and gonococci. Bacitracin, the active principle of the *Bacillus subtilis* group was isolated from injured tissue from wound infections by Johnson and associates of the departments of surgery and biochemistry, Columbia University College of Physicians and Surgeons.

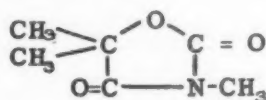
In using bacitracin locally to treat a number of human infections due to hemolytic streptococci and staphylococci, the results are equal to response in similar cases to local penicillin therapy. Not enough material has been available as yet for systemic treatment. If attempts to produce bacitracin by large scale commercial methods are successful, the new antibiotic should be cheaper than penicillin.



# TRIDIONE

Definitely effective in the treatment of several forms of epilepsy resistant to ordinary anticonvulsant drug therapy is the new chemical tridione. The recently developed drug, a product of the Abbott Laboratories, is not yet on the market but is being studied extensively in several clinics. Results with tridione therapy are said to be dramatic in certain types of epilepsy. The principal advantages of the novel drug are that it gives positive benefit in the treatment of petit mal, myoclonic, akinetic and psychomotor epilepsy, forms of the disease which are usually not only resistant to anticonvulsant therapy but in which the frequency of attacks may be actually increased by certain anticonvulsant drugs. Tridione is not considered effective in grand mal epilepsy.

Tridione is a new compound with analgesic, sedative and anticonvulsant properties. In fact it was originally submitted to trial as an analgesic drug and it was not until later that its valuable anticonvulsant properties were uncovered. The chemical (3,5,5-trimethyloxazolidine-2,4 dione) is a white crystalline powder with a faint balsamic odor. Soluble to about 5 per cent in water, it forms neutral solutions. Its solubility is greatly enhanced by urethane and alcohol. Tridione may be administered orally, or by intravenous, intramuscular or deep subcutaneous injection. It is usually given orally in capsules containing 0.32 gm.



Tridione

Although tridione has an analgesic action, at present interest is centered around its anticonvulsant effect. Everett and Richards<sup>2</sup> studying a group of related compounds found that tridione was the most potent analgesic in the series and also possessed definite anticonvulsant properties. They found it effective in antagonizing convulsions induced in mice, guinea pigs, cats and rabbits by the administration of various convulsant drugs including metrazol, strychnine, picrotoxin, thujone, cocaine and procaine. Tridione also increases the threshold at which electrically induced convulsions can be produced. As the result of pharmacological studies showing its anticonvul-

## A MODERN DRUG EFFECTIVE IN FORMS OF EPILEPSY RESISTANT TO ORDINARY MEDICATION.

sant action, the application of tridione to the treatment of epilepsy has been studied in several clinics.

There are several forms of epilepsy some of which respond to therapy with tridione while others do not. Lennox<sup>3</sup> states that the three main manifestations of epilepsy - convulsions (grand mal epilepsy), periods of amnesia (psychomotor epilepsy), and transient lapses of consciousness (petit mal epilepsy) - are distinct as regards drug therapy. Myoclonic epilepsy, single contractions or jerks of the flexor muscles without loss of consciousness, and akinetic epilepsy, the sudden loss of postural control, have not responded too well to treatment with previously available drugs.

The treatment of petit mal, akinetic epilepsy and myoclonic epilepsy has been notoriously ineffective according to Lennox.<sup>3</sup> Petit mal epilepsy which occurs more often in those under 20 years, and myoclonic epilepsy are often spontaneously cured - but during their persistence the social and educational life of the child is hampered by recurring daily attacks. Diphenylhydantoin sodium while effective for grand mal attacks often increases the frequency of petit mal seizures. Phenobarbital is usually only of temporary or partial assistance in petit mal. Tridione seems to show more benefit in the relief of petit mal attacks than any other available drug.

While the usual anticonvulsant drugs seem to have little effect on patients with psychomotor seizures, tridione shows considerable promise in the therapy of this disease. For grand mal large doses of tridione are necessary and it is said to be probably no more effective than phenobarbital or diphenylhydantoin sodium.<sup>1</sup> The bromides, phenobarbital and diphenylhydantoin sodium have proved to be quite effective in reducing the frequency of grand mal attacks.

Administering tridione in a dosage of 1.0 to 2.0 grams daily to a group of 50 patients with daily seizures of petit mal, myoclonic or akinetic epilepsy not helped by previous medication, Lennox<sup>3</sup> reports that in a period of days to weeks the

seizures ceased in 28 per cent, were reduced to less than one-fourth of the usual number in 52 per cent, and were little affected in 20 per cent. In several patients the seizures, once stopped, did not recur. Ten of the patients in the group studied also experienced frequent grand mal seizures. In these, tridione stopped or lessened petit mal but either proved ineffective against grand mal seizures, or increased them.

Administering tridione orally in a dosage of 0.32 gram three times a day to a group of 6 patients whose psychomotor seizures had in no instance been controlled by the use of other drugs. DeJong<sup>1</sup> found the drug effective in the control of psychomotor seizures. In some cases he reported spectacular improvement. However, since most of the patients studied were subject also to grand mal and petit mal seizures, it was necessary to continue to control these with phenobarbital, bromides and/or diphenylhydantoin sodium. In these cases the use of tridione in conjunction with other anticonvulsant therapy almost completely controlled the psychomotor seizures in a large percentage of cases.

Studying the effects of tridione as compared with phenobarbital and diphenylhydantoin sodium in a group of 11 mentally defective institutionalized epileptics, Thorne<sup>4</sup> found that 3 were better controlled by tridione than by other medication, 6 were essentially unchanged, and 2 had

more seizures. The cases reported in the study were of grand mal, a type of epilepsy believed by others not to respond any better to tridione therapy than to treatment with phenobarbital or diphenylhydantoin sodium.

Administering tridione in doses of 1.0 gram both subcutaneously and intravenously to patients with status epilepticus Thorne<sup>4</sup> found these seizures could be quickly terminated without unpleasant symptoms. In four patients to whom the drug was given intravenously the convulsive movements ceased within fifteen to thirty seconds after the injection and remained controlled for several hours.

The principal side effect of tridione is photophobia which affects older children and adults more frequently than the young. When given in large doses (1.0 to 1.3 grams) several times a day there occurs a reduction in the acuteness of vision, blurring, and a sensation as though it were snowing and that all objects were covered with a light film of snow, or that all objects appear yellow. In contrast, smaller doses (0.32 gram) given three times a day produce no reported symptom of toxicity and there is no apparent contra-indications or limitations to the use of the drug.<sup>1</sup> Skin rashes have been reported. Its acute and chronic toxicity in experimental animals was found to be very low.

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A position as Junior Pharmacist is open in the Department of Pharmacy, University Hospital, Ann Arbor, Michigan. The work consists of rotating schedules giving experience in the preparation of parenteral medication, manufacturing, preparation of allergens, extemporaneous compounding and dispensing. The working hours are 44 per week, with a divided call schedule. Living accommodations may be obtained in the men or women's intern quarters. One month vacation

with pay is allowed. For further information write Don E. Francke, chief pharmacist.

The Clifton Springs Sanitarium and Clinic is in need of an additional pharmacist for its staff. For additional information please write to Maxwell Riegel, chief pharmacist, a Clifton Springs, New York.



## THE DEPARTMENTS

## OF PHARMACY

## AND

The Pharmacy Department of Mercy Hospital was established when the hospital was built in 1919 and comprised one room on the ground floor. It was under the supervision of a registered pharmacist while three Sisters studied pharmacy. The pharmacy was later relocated on the sixth floor, where it consisted of a prescription room and a room for stock.

In 1940 a new wing was added to the hospital, which is general in type and accommodates about three hundred patients. The surgery department was moved to the sixth floor of the new wing, leaving the seven rooms which were formerly used for surgery to be used for pharmaceutical operations and central supply.

### DESCRIPTION

Entering the small pavilion at the left, we come to the central supply workroom, 10' x 20', with cupboard built from floor to ceiling, with sliding ladder. A cupboard and sink are attached to the opposite wall. A large work table completes this room.

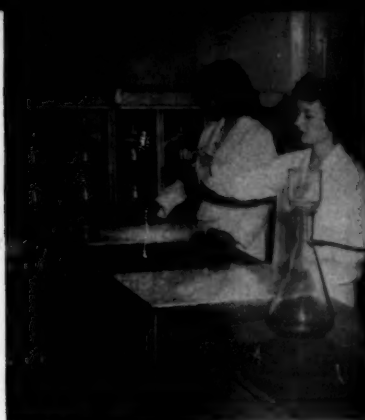
The next room is a large dispensing room, 18' x 22 1/2', with wall cabinets which contain the various trays and other sterile material ready to be dispensed. The lower part of these cupboards contains twelve bins where sterile packaged materials are stored. Three metal cabinets with glass doors were salvaged from the old

surgery department, and are used to an advantage for storing equipment to be dispensed. Three metal cabinets with fifteen drawers, fastened together and covered with a single piece of stainless steel, provide six yards of table space. A white porcelain cabinet is used as a glove unit where gloves are mended and prepared for sterilization. Many gloves are salvaged by cementing wrists and fingers from gloves that cannot be mended. Talcum dust in the room is avoided by keeping talcum in the drawers where the mended gloves are kept. A dressing carriage equipped with the various types and sizes of sterile catheters - foleys, robinsons, phillips, pezzers, and other articles used, is much appreciated by the doctors doing urology. A small dressing cart is used for eye x-rays and ten carts for general dressings.

The next room is the sterilization room, 10' x 18 1/2', which connects the central supply and prescription room and is used by both departments. It contains two work tables, two autoclaves, two cupboards for non-parenteral sterile solutions, and two ten-gallon per hour stills. A twelve-gallon receiving bottle from the new still is fastened to the wall in the pharmacy.

The next room is the prescription room and is 18' x 22 1/2'. A stainless steel covered metal work table, with four bins for chemicals, is placed underneath the twelve-gallon receiving bottle. A small window was cut through the wall so that parenteral vial and liter preparations can be passed through into the sterilization room to be





## CENTRAL SUPPLY

## MERCY HOSPITAL

TOLEDO, OHIO

By Sister Mary John, R.S.M.,  
Chief Pharmacist

autoclaved. This has been done in preparation for making parenteral solutions, which we have not as yet undertaken. However, we have effected quite a saving by making parenteral amino acid, codeine, papaverine, pantopon, thiamine and other medication, such as procaine, sodium iodide and sodium salicylates for intravenous use. This corner may later be closed in with glass for aseptic reasons. The new prescription cabinet, enclosed in glass blocks, contains two prescription desks with five drawers and adequate equipment. The center of the cabinet contains drawers for waste, bottles and other packaging equipment. Back of the Schwartz cabinets are shelves where tablets are stored as well as standard bottles of filled floor supplies. A glass showcase for ampoules and another one for vitamins, a small porcelain table, two chairs and a frigidaire complete this room.

Off the prescription room is a small room, 12' by 17 1/2', which has been divided into a storage room and a small room suitable for a control laboratory which is not yet complete.

Adjoining the control laboratory is a manufacturing room which is also used in the morning for filling drug baskets. This room contains a steam sterilizer, water suction pump, two sinks, a bottle rack with ten two-gallon bottles used in manufacturing and a long narrow table cabinet which provides ample working space. This room has a built-in locked cabinet for three barrels of alcohol and cabinets for nine other barrels equipped with pumps. The cost of such drugs

as hydrogen peroxide and glycerin in barrel lots has decreased tremendously.

The last room of the pavilion contains professional supplies in two wall cabinets, and is also used as an office. A four drawer file, for literature, a bookcase, with a small but growing library, a typewriter, an adding machine and office furniture complete this room. Visible index records are used for stock control and a perpetual inventory is maintained. Its value is calculated every third month and sent to the bookkeeping office. An actual inventory is taken in December and this is checked by the auditor. Inventory entails a lot of labor, but it pays. By using official nomenclature, duplications are very apparent and are reduced. Stock that moves slowly can be returned for credit. Any difference in price is quickly noted, as well as the amount that should be purchased. A full time secretary would be a decided asset in this work.

### DUTIES OF THE STAFF

1. A competent technician, who has been here for twelve years, has charge of the central supply workroom. She keeps it in order, seeing that the porter does the necessary cleaning, makes up all surgical dressings, and cleans and wraps all syringes, needles and other floor supplies.

2. The dispensing room is kept in order by another competent technician whom we have trained,

and who has become a valuable member of the department. Although she lives twenty-five miles from Toledo, she commutes Mondays through Fridays because she enjoys her work. She checks syringes and instruments daily, sets up the trays and wraps and autoclaves supplies. She gives out articles upon requisition and makes out the charges. In addition, two graduate nurses work out from this room and give the intravenous solutions to the patients. One works from seven in the morning until three, and the other from three until eleven at night. These nurses have been trained for this work and are very adept at it. They are also responsible for the return of equipment to central supply.

3. The sterilization room: Each department is responsible for its own sterile supplies. However, a nurse, who works from three in the afternoon until eleven at night, does the sterilizing for both departments. Her duties are to dispense the necessary supplies from both the central supply and pharmacy. She makes and sterilizes about 500 gallons of non-parenteral solutions per month, such as distilled water, boric acid, magnesium sulphate and normal saline. Prescriptions that need compounding at night can be ordered by her and will be delivered as late as ten-thirty.

4. The prescriptions and chart orders are filled by the intern-pharmacist and pharmacist. The narcotics and barbiturates are dispensed in numbers of 25 tablets or c.c., and a corresponding record with 25 numbers. No narcotics are issued unless the record balances and has been checked every eight hours by the nurses going off duty. A monthly inventory of all narcotics is made, and the record must balance with the narcotics used. Each month's records are then wrapped, labeled and are ready for the narcotic inspector if he should call. The intern-pharmacist assists with this work, as well as with the inventory. She makes out the monthly alcohol report under supervision, and assists with the purchasing. She is free to observe the work in the blood bank, and assists in making plasma. She will spend a few weeks in the central supply to learn sterile technique. By preparing articles for sterilization, she will learn the names of the different types of syringes, needles, catheters and instruments. As we are just beginning intern training, we are following the outline used at St. Luke's Hospital, Cleveland, where our present intern has just completed a month's work preparing parenteral solutions. I should like her to have another month at the end of her year at the hospitals of either the University of Michigan or Western Reserve, to give her an idea of the

work done in the larger hospital pharmacy.

In the manufacturing room, a pharmacy helper comes on duty at 7 o'clock in the morning and works eight hours. She is an expert at filling drug baskets and professional supplies for the floors. She delivers all supplies to the departments and returns all requisitions properly endorsed by the head nurses. She unpacks incoming stock, and assists in manufacturing. She is very accurate and does not mind having her work checked. Another helper comes on duty at 8:30 in the morning and works until 5 o'clock. She does the cleaning, washes and autoclaves bottles, and washes the glassware and other utensils used in prescription work and manufacturing. She mends the gloves and prepares them for sterilization. She also cleans and replenishes ten dressing carts daily.

### CONCLUSION

There is still much more to be done, but we feel that we have made some progress in the interest of pharmacy. By the diligent application to assigned duties by a cooperative group, we are able to give the patient competent service.

The location of the pharmacy is unusual; however, for the intern pharmacist, it is possibly an advantage. She has close contact with the x-ray, surgery and laboratory and can attend post mortems and pathological conferences occasionally, as well as observing an interesting operation. We had splendid girls from the University of West Virginia who spent three months here during the summer and were a great help during the vacation period. They returned to complete their senior year of pharmacy and will receive credit for their work. Our present intern returned from St. Luke's Pharmacy in Cleveland with an outline for making about 75 different sterile solutions and with much enthusiasm which is somewhat contagious. We have already added to the list of 105 preparations that we manufacture, sterile vial medication of Metycaine, Tetracaine, Dextrose 50%, Morphine, Dilaudid, Pyridoxine and Riboflavine. As soon as we have adequate equipment and personnel, we will make our parenteral solutions. I would like our present intern to remain and attend the University until she has completed the requirements for a Master of Science degree. Needless to say we are most grateful to Mrs. Scott for her assistance and feel that she should receive the Remington Medal for the contribution she has made to hospital pharmacy.

# CURRENT LITERATURE

## OF HOSPITAL PHARMACY

### HOSPITAL MANAGEMENT (December 1945)

"Careful Study of Pharmacy Operations As Prelude to Efficient Service" by William R. Collins, assistant pharmacist, Pharmacy of Research and Educational Hospital, University of Illinois, Chicago - A survey of the work being done is helpful in planning a hospital pharmacy. page 105

"How to Handle Drugs in The Small Hospital" by Dorothy E. Tobin, pharmacist, Foote Memorial Hospital, Jackson, Michigan - A method for handling drugs in a small hospital is discussed with emphasis on the handling of narcotic drugs. page 110

### HOSPITAL MANAGEMENT (January 1946)

"Manufacturing Pharmacy Serves Patients, as Teaching Tool, in Research" by Herman O. Thompson, Ph.D., associate professor of manufacturing Pharmacy, University of Illinois, Chicago - A discussion of the manufacturing pharmacy at University of Illinois. page 80

### HOSPITALS (January 1946)

"Administration of An Effective Pharmacy Requires a Sound Policy" by Mrs. Evelyn Gray Scott, chief pharmacist, St. Luke's Hospital, Cleveland - One of a series of articles on hospital pharmacy appearing in Hospitals. The scope of the administrative policy is discussed under personnel regulations, hours of operation, pricing, buying, dispensing and records with emphasis on the fact that an administrative policy is feasible and necessary for small hospitals as well as large hospitals. page 58

"Drug Supply Demands Protection from Thefts" by Frank J. Smith, supervisor, Bureau of Narcotic Control, New York Department of Health, Albany - Emphasis on narcotic control in hospitals is pointed out, considering the personnel an important factor. page 54

### MODERN HOSPITAL (December 1945)

"The Value of Manufacturing" by H. George DeKay, professor of pharmacy, Purdue University School of Pharmacy, Lafayette, Indiana - Hospital pharmacists are urged to manufacture in view of the value that accrues to the pharmacist himself, to his profession in general and to the hospital he serves. page 102

### SOUTHERN HOSPITALS (December 1945)

"Industrial Firm's Pharmacy - One of Oldest of Its Kind" - A brief description of the Employees' Hospital of the Tennessee Coal, Iron, and Railroad Co. located in Fairfield, Alabama. page 78

"Investigation of Pharmacist Should Precede Employment" - Hospital Administrators should check the record and qualifications of pharmacist before employing him. page 79

### SOUTHERN HOSPITALS (January 1946)

"Materia Medica - Subject of Great Importance to Nurses is the Jonah" - Suggestions for teaching materia medica to student nurses are listed. page 72

### AMERICAN PROFESSIONAL PHARMACIST (December 1945)

"What About Our Pharmacy Boards?" by Adelaide R. Bobbett, chief pharmacist, St. Louis Jewish Hospital, St. Louis, Missouri. Our rising educational standards must be accompanied by elevated standards of examination and licensure page 1124

"Dispensing in State Institutions" by R. G. McKibben, Missouri State Hospital No. 1, Fulton, Mo. Opportunity for formulation of standard pharmaceuticals and of many preparations for the use in a state institution comprises a major portion of the work. page 1128

### AMERICAN PROFESSIONAL PHARMACIST (January 1946)

"Labeling and Storage Policies" - Responsibilities of the hospital pharmacist in the proper labeling and storage of medicinals. page 60

### JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION (January 1946)

"Opportunity For Veterans" - An editorial by Leo F. Godley, American Society of Hospital Pharmacists - The need for expanding pharmacy service to all hospitals having over 50 beds is pointed out noting that there are many openings to be filled. page 37

"Pharmacy of Penicillin Used by Inhalation" by Francis X. Sturner, chief pharmacist, Buffalo General Hospital, Buffalo, N.Y. - Method of preparation and administration, including equipment necessary, for use of penicillin by inhalation are given. page 38





# NEWS ITEMS



## PLASMA RELEASED

An estimated one and one-quarter million packages of dried blood plasma is being released by the American Red Cross for distribution by the State Departments of Health to hospitals and physicians for free use in civilian medical practice. The hospital or physician may charge a fee for services in the administration of the plasma, but may not charge for the plasma itself.

## TRI-STATE HOSPITAL ASSOCIATION WILL MEET

The Tri-State Hospital Association will hold its annual meeting May 1 - 3 at the Palmer House, Chicago. Hans S. Hansen, chairman-elect of the Society is planning the program for the pharmacy section.

## O.S.H.P. TO HOLD ANNUAL MEETING

The Ohio Society of Hospital Pharmacists will hold its annual spring meeting with the Ohio Hospital Association April 3 at the Deshler-Wallick Hotel in Columbus.

## A.H.A. APPOINTS COMMITTEE ON PHARMACY

The Committee on Pharmacy of the American Hospital Association has recently been appointed by Dr. Robin C. Buerki, chairman of the Council on Professional Practice. The committee includes: Dr. Chauncey D. Leake, dean of the School of Medicine, University of Texas, Galveston, chairman; Mr. Paul F. Cole, chief pharmacist, Michael Reese Hospital, Chicago; Dr. Troy C. Daniels, dean of the University of California College of Pharmacy, San Francisco; Dr. E. R. Serles, dean of the University of Illinois College of Pharmacy, Chicago; Dr. Frank C. Sutton, assistant medical director, Rochester General Hospital, Rochester, New York; and Mr. Don E. Francke, chief pharmacist, University Hospital, Ann Arbor, Michigan.

...Thiouracil has now been released.

## D. O. McCLUSKY ADDRESSES AMERICAN COLLEGE OF SURGEONS

D. O. McClusky, Jr., chief pharmacist and assistant administrator at South Highland Infirmary, Birmingham, recently addressed the American College of Surgeons meeting in that city. Mr. McClusky spoke on "Developing and Maintaining Standards in the Hospital Pharmacy." In addition to his positions at South Highlands Infirmary, Mr. McClusky is also editor of the Hospital Pharmacy section of Southern Hospitals and is past president of the Southeastern Hospital Pharmacy Association.

## SURPLUS PROPERTY

Those interested in obtaining surplus property for use in their hospital should write the Federal Security Agency, U. S. Public Health Service, Office of Surplus Property, Railroad Retirement Building, Washington, D.C. for a copy of "Instructions For Public Health Claimants." The instruction sheet will list the location of regional offices of the War Assets Corporation where surplus materials are handled. Communicate with the regional office serving your locality and ask to be placed on their mailing list to receive listings of available surplus property. You may also confer with them concerning property you are interested in, but which has not been listed. Non-profit health institutions are entitled to a 40 per cent discount from the stated value. Drugs and medical supplies are among the available surplus property. One might also consider the possibility of obtaining long needed equipment for his department. Among other items that are expected to be available are balances of all types, tablet machines, mixers of the Hobart type, filing equipment, microscopes, stainless steel mixing tanks and other laboratory equipment.

## HERBERT SKINNER MEMORIAL FUND

The Herbert Skinner Memorial Fund has been established by the Pharmaceutical Society of Great Britain to provide a permanent memorial in the form of furnishings for the British Pharmaceutical

Codex Committee rooms of the new building of the Pharmaceutical Society to be completed in Brunswick Square, London. Mr. Skinner, who was appointed chairman of the Pharmaceutical Codex Revision Committee in 1929, was one of Great Britain's outstanding hospital pharmacists. During his visits to the United States Mr. Skinner displayed an enthusiastic interest in the problems of American hospital pharmacy. His many friends in the United States as well as those who were not privileged to know him personally will be pleased to know that their contributions to the Herbert Skinner Memorial Fund will be accepted. They should be sent to the Honorary Treasurer of the Herbert Skinner Memorial, Mr. J. C. Young, Ph.D., President of the Pharmaceutical Society of Great Britain at 34 Bethune Road, London N 16, England.

#### A.P.H.A. LISTS PHARMACISTS

The American Pharmaceutical Association is compiling a list of pharmacists who may be interested in a career in the veterans administration, public health service, military or other government agency. Dr. Fischelis is limiting the register to pharmacists who are graduates of an accredited four-year course.

#### STREPTOMYCIN DISTRIBUTION

Streptomycin distribution is expected to be handled in a manner similar to that employed with initial allocations of penicillin. Dr. Chester S. Keefer, of Evans Memorial Hospital, Boston may supervise the allocation of streptomycin through an agency similar to that which handled penicillin, either under government control or under an industrial arrangement.

#### HOSPITAL PHARMACY DEPARTMENT ESTABLISHED

At least one additional hospital pharmacy department has been established as a result of Evelyn Gray Scott's article in the January issue of *Hospitals*. After reading Mrs. Scott's article "Administration of an Effective Pharmacy Requires a Sound Policy," an Ohio hospital administrator wrote to Mrs. Scott stating he was convinced his hospital needed a pharmacy department and asked for names of available pharmacists.

#### PURDUE ESTABLISHES MASTER'S DEGREE IN HOSPITAL PHARMACY

A course leading to a Master's degree in hospital pharmacy has been established at the School of Pharmacy, Purdue University, Lafayette, Indiana. Under the program as approved by the Graduate Council, a student majoring in hospital pharmacy will receive the Master of Science degree after completing 33 semester credit hours of graduate work. There is no language or thesis requirement for this degree since the work is considered as advanced professional education and thus differentiated from work training for research.

JANICE OLDHAM AND HENRIETTA ZORN, February graduates of Western Reserve Pharmacy School are now interning at St. Luke's Hospital in Cleveland.

DON TONJEC, just out of the service has accepted a position as staff pharmacist at Aultman Hospital, Canton, Ohio. John Miller, chief pharmacist is reorganizing the pharmacy department.

NEL JOHNSTON has returned from the Navy and is now pharmacist at Children's Hospital in Columbus, Ohio. Robert Porter, formerly chief pharmacist at Lakeside Hospital is superintendent at Children's Hospital.

...Penicillin in 500,000 unit vials is now available from several manufacturers.

#### COMMANDER W. PAUL BRIGGS NAMED CHIEF PHARMACIST

Direction of pharmaceutical affairs in the Veterans Administration under the newly created Department of Medicine and Surgery is now held by W. Paul Briggs, recently appointed as chief Pharmacist by General Omar N. Bradley, Director of the Veterans Administration. The newly appointed chief pharmacist will direct pharmaceutical services supplied in Veterans Administration facilities throughout the country.

Mr. Briggs holds a Bachelor of Science degree from George Washington University and the Master of Science degree from the University of Maryland and has been dean of the School of Pharmacy of George Washington University.



# NOTES

*and*

## EXCHANGE TRUCK

Several years ago we had difficulty in getting all of the large solution bottles into a convenient size drug tray for delivery to the pharmacy from our wards. Naturally, we had the same difficulty when we checked our trays to be sent back to each location. Our nurses also complained that making the lengthy drug requisition out daily required considerable time.

We solved our problem by organizing the pharmacy exchange truck. Every day this truck is sent to each ward of the hospital and the empty bottles of lysol, mouth wash, glycerin, mineral oil, hand cream, liquid soap, Dobell's solution, milk of magnesia, and salt solution for compresses are exchanged for full bottles. A printed record sheet listing all of the items makes it easy for the operator to make a statistical record for each daily trip. At the end of each month we total the report. Then we are able to spot the locations that are using an unreasonable amount of any medication and can report it to our nursing office for investigation. Submitted by Miss Lucy Lee Kennedy and Mr. Archie Millis, Duke University Pharmacy, Durham, North Carolina.



## SODIUM LACTATE INJECTION

In a previous issue of THE BULLETIN 2:104 (July-August) 1945, there were several formulas for the preparations used in the treatment of acidosis. The preparation of sodium r-lactate injection involved boiling a mixture of lactic acid and sodium hydroxide solutions.

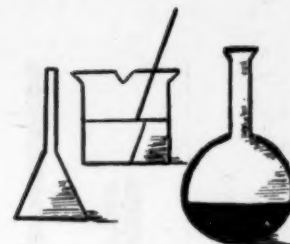
We use an alternative method in the preparation of this solution. Mix 100 cc of 60% sodium lactate (Merck) with 435 cc of freshly distilled water, add a small amount of phenol red as an indicator and the resultant product is a molar lactate solution.

The molar lactate solution may be put into flasks of 50 cc and autoclaved at 15 pounds pressure for 15 minutes. This solution must be diluted to M/6 for subcutaneous use; for intravenous use this strength is usually suitable, but in the presence of cardiac insufficiency somewhat stronger solutions (M/5 or M/4) are preferable. If it is desired, a stock solution of M/6 sodium lactate solution may be prepared and kept ready for use by merely mixing 1 part of molar lactate solution with 5 parts of freshly distilled water and autoclaving. Submitted by Blanche E. Burrus and Mrs. Elizabeth Mattison, Duke University Pharmacy, Durham, North Carolina.





# SUGGESTIONS

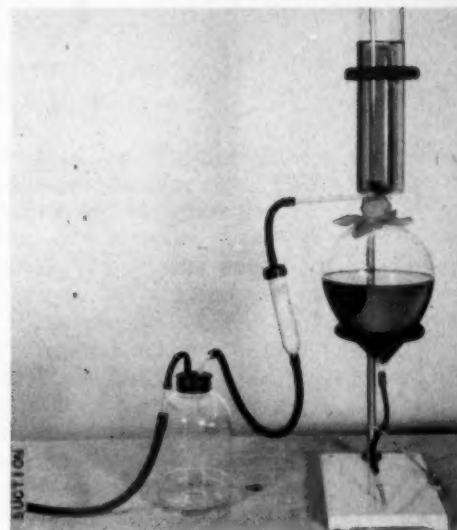


## INJECTION SULFADIAZINE SODIUM 10%

Sodium sulfadiazine may be prepared by reacting equivalent amounts of sulfadiazine and sodium hydroxide. In preparing the solution for injection great care must be taken to keep out carbon dioxide since the latter compound precipitates free sulfadiazine.

	Gm or cc
Sulfadiazine	367.7
Sodium Hydroxide C.P. pellets	58.8
Pyrogen-free Distilled Water, to make	4000.0

**Procedure:** Boil 4000 cc of pyrogen-free distilled water to remove the carbon dioxide. When cool, dissolve the sodium hydroxide in about 1000 cc of the boiled water. Add the sulfadiazine and stir until dissolved. Add sufficient of the boiled water to make 4000 cc. Pass the solution through a Berkefeld bacterial filter, using a soda lime tube in the air line to absorb carbon dioxide. Fill into sterile ampules or 50 cc pyrex bottles. If bottles are used fill the bottle to within a half-inch of the top and seal tightly with rubber lined screw caps. Rubber lined screw caps can be obtained from Owens-Illinois. Observe aseptic technic throughout. Test for sterility. The final pH will be approximately 10.



## INFRA-RED LAMP USED TO KEEP OINTMENTS SOFT WHILE MILLING

To keep ointments soft while milling heat your mill with an infra-red lamp. These lamps, complete with base, cost only a few dollars and may be obtained through any electrical supply store. The illustrated lamp is a General Electric 250 watt, 105-110 volt reflector drying lamp. Since infra-red rays penetrate beneath the surface and cause drying from within, they are also ideal for drying tablet granulations and many other uses.



**R**

### VITAMIN A AND D OINTMENT

A vitamin A and D ointment which does not have the disagreeable odor of cod liver oil may be readily made by incorporating an A and D concentrate with a mixture of wool fat and petrolatum.

Vitamin A	100,000 U.S.P. Units
Vitamin D	20,000 U.S.P. units
Wool Fat	20 Gm.
White Petrolatum, to make	100 Gm.

### SODIUM CITRATE - DEXTROSE SOLUTION

The formula for the Anticoagulant Acid Citrate Dextrose Solution tentatively accepted for inclusion in U.S.P. XIII is as follows:

Sodium Citrate	22	Gm.
Citric Acid	8	Gm.
Dextrose	24.5	Gm.
Water For Injection, to make	1000	cc

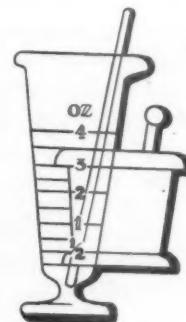
The pH after sterilization by steam under pressure is from 4.5 to 5.5.

### SUSPENSION OF SULFADIAZINE

A formula for a palatable suspension of sulfadiazine has been developed by Chiba and Phillips of the University Hospital Pharmacy, Ann Arbor, Michigan. Each 4 cc of the suspension contains 0.25 gram of sulfadiazine and 0.3 gram of sodium citrate. The latter compound is included to render the urine alkaline and thus to prevent crystalluria. Any member of the Society desiring a sample of the suspension of sulfadiazine may obtain it by sending their request to THE BULLETIN, American Society of Hospital Pharmacists, 1313 Ann St., Ann Arbor, Michigan.

	Gm or cc
Sulfadiazine powder	62.5
Pectin	7.0
Sodium Citrate	75.0
Benzaldehyde	0.2
Zephiran Chloride Solution 12.5%	1.0
Syrup	500.0
Orange Flower Water	200.0
Distilled Water, to make	1000.0

**Procedure:** Rub the pectin until smooth with a small amount of syrup. Add the remainder of the syrup. Add the other ingredients, having first dissolved the sodium citrate in the orange flower water. Mix thoroughly and pass the mixture through a homogenizer.



# PUBLIC HEALTH

## Today

### INDIANA BOARD OF HEALTH REGULATES PHARMACY IN HOSPITALS

In Indiana the practice of pharmacy in hospitals is controlled by the State Board of Health. The inspection and licensure of hospitals is under the supervision of a Hospital Council which in turn is subsidiary to the State Board of Health. **Dr. Glenn L. Jenkins**, dean of the School of Pharmacy, Purdue University, is a member of the State Board of Health. At a November, 1945 meeting the Board of Health promulgated regulation HHL36 which regulates the practice of pharmacy in Indiana hospitals.

#### Regulation HHL36

##### Pharmacy:

(a) In hospitals with 30 beds or more the pharmacy or drug room shall be under the supervision of a pharmacist, employed full time or part time, licensed to practice in the state of Indiana.

The pharmacy operating in connection with a hospital shall comply with regulation HHL33, and it shall comply with the provisions of the pharmacy law requiring registration of drug stores and pharmacies and with the regulations of the Indiana State Board of Pharmacy, and with the provisions of the Indiana Food, Drug and Cosmetic Act, Chapter 38, Acts of 1939 and all regulations promulgated thereunder.

(b) In hospitals of less than 30 beds where the drug room is not under the supervision of a licensed pharmacist, the services of a pharmacist in the community or a pharmacist inspector from the Indiana State Board of Health, shall be obtained periodically to consult with the hospital administrator relative to the labeling, storage, and dispensing of drugs.

(c) The pharmacist shall with the approval of the administrator of the hospital initiate rules, regulations, and procedures to provide for the administrative and technical guidance in all matters pertaining to the handling and dispensing of drugs.

### HOSPITAL CONSTRUCTION BILL Senate Bill 191

Senate bill 191, known as the Hospital Construction Bill was introduced January 10, 1945 by Senator Hill for himself and Senator Brown. The bill passed the Senate by a voice vote December 11, 1945; the next day it was received by the House and referred to the Committee on Interstate and Foreign Commerce which will begin public hearings on the bill March 7, 1946.

The Hospital Construction Bill provides for the authorization of grants to states for surveying their hospital and public health center needs, for planning for the construction of additional facilities, and authorizes grants to assist in such construction. At the time of the hearings the American Hospital Association and the American Medical Association endorsed the bill in principle.

An appropriation of five million dollars is authorized for the survey and planning program of the bill, and 75 million dollars is proposed for each of the fiscal years 1947 through 1951 for the construction program.

The Surgeon General of the U.S. Public Health Service, with the assistance of the Federal Hospital Council would administer the overall provisions of the bill. The Federal Hospital Council which would represent experts in the hospital field as well as consumers of hospital services, will be appointed by the Federal Security Administrator. Individual state construction plans will be administered by a state agency under conditions provided for in the bill.

### HOSPITAL PHARMACIES IN PENNSYLVANIA MUST HAVE REGISTERED PHARMACIST

Hospital pharmacies in Pennsylvania must be under the supervision of a registered pharmacist and must comply with the state pharmacy law according to recent Formal Opinion 533, prepared by Attorney-General James H. Duff and Deputy Attorney-General Harrington Adams.



Hospital pharmacies must be registered with and obtain a permit from the Pennsylvania Board of Pharmacy. The two dollar fee required for registration is considered a license fee from which hospitals are not exempt. If the two dollars paid for registration were considered a tax levied solely for revenue purposes then hospitals would be exempt. However, since the fee is levied for regulatory purposes hospitals are not exempt from payment of the fee and must comply with the regulations of the state pharmacy law.

#### VETERANS ADMINISTRATION TO BUILD 77 NEW HOSPITALS

Within the next two years the Veterans Administration plans to have 77 new hospitals built. When the program is completed the agency will have 183 permanent hospitals with a bed capacity of 151,500. These hospitals will include 105 general medical and surgical institutions, 49 devoted to neuropsychiatric work, and 29 tuberculosis units. When possible, the hospitals will be erected close to medical schools or medical centers in order to provide a ready consultation of specialists to the veteran.

#### TWO YEAR PHARMACY BILL KILLED BY GEORGIA

A recent measure which would have permitted persons with two years' college credit to take the state examination in pharmacy was killed by the house health committee of the Georgia legislature. The bill was vigorously opposed by a large number of Georgia pharmacists.

#### PRIEST MENTAL HYGIENE BILL

A bill to establish a National Neuropsychiatric Institute as a part of the U.S. Public Health Service was introduced by Representative J. Percy Priest on March 9, 1945. The emphasis of the bill is on research, prevention, methods of diagnosis and treatment of neuropsychiatric disorders. If this bill, HR4512, were enacted it would provide funds and facilities for psychiatric training and research.

#### PEPPER MATERNAL AND CHILD WELFARE SERVICE BILL

The Pepper bill for Maternal and Child Welfare Service offers a program which would be carried out through allotments of grants-in-aid to the states. Any mother or child would be eligible to participate. Under provisions of the bill maternity care, including medical, dental, hospital, nursing and related services would be provided. For children, school health services, dental care, preventive medicine and care of the sick would be furnished.

The crippled child is given special consideration since the bill provides not only for the treatment of the child but also provides facilities to seek out children who need services.

#### FISCHELIS SEES 10,000 HOSPITAL PHARMACISTS WITHIN 10 YEARS

"It is not inconceivable that as many as 10,000 pharmacists may be satisfactorily employed in the hospitals of our country within a decade," said Dr. R. P. Fischeles' secretary of the American Pharmaceutical Association while addressing the Massachusetts Pharmaceutical Association at a recent meeting held in Hotel Sheraton, Worcester. Pharmacists will be very greatly affected by the new trends in the field of public health, and pharmacy must reorganize its ranks in order to prepare itself for its rightful place in contributing to the development of the field of medicine, according to Dr. Fischelis.

#### TO PRESS ADOPTION OF METRIC SYSTEM

Pointing out that the metric system has been adopted throughout the world except in the United States and Britain, Dr. John T. Johnson, president of the Metric Association and head of the mathematics department of Chicago Teachers' College is planning a campaign to put the United States on the metric system of weights and measures. The campaign is to be supported by scientific, educational, business and industrial groups. Turkey, Japan, China and Russia accepted the metric system in 1920-21. It was legalized by Congress in 1866 but has never been widely accepted. Legislation was introduced in Congress in 1922 and 1924 to force its adoption but the measures were defeated. The adoption of the metric system by the United States Pharmacopoeia, the National Formulary and the Council on Pharmacy and Chemistry should contribute much to its increased use in the field of science.

# THE CHEMICAL NATURE OF PENICILLIN

## RESULTS OF AMERICAN AND BRITISH WORK ANNOUNCED

INFORMATION on the chemistry of penicillin has been long—indeed, far too long—awaited. During the war scientists have accepted without question the need to keep the results of certain lines of research secret. Even in wartime, however, a case could be made on humanitarian grounds for the free publication of the results of work on penicillin. To continue the ban for seven months after the end of the war in Europe is an infringement of the accepted rights and ideals of scientists which may prove a dangerous precedent.

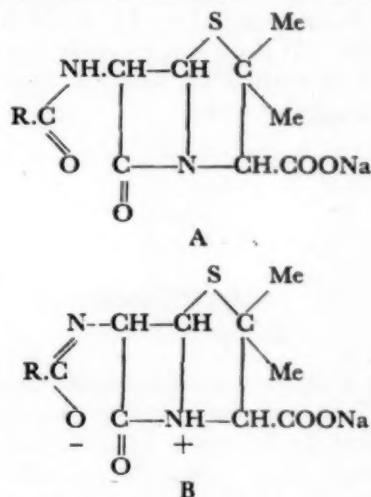
The amount of chemical information now at last released—under the joint auspices of the Committee on Medical Research (Washington) and the Medical Research Council (London)—is in some ways disappointing. It is concerned with results rather than with methods; it makes no mention of the contributions of individual workers and teams; it makes no mention of the methods used for the isolation of pure, crystalline penicillin, a particularly interesting feature of the work; and it makes no definite mention of progress towards synthesising penicillin itself. Nevertheless it is a welcome whet to the chemical appetite and there is satisfaction in knowing that full details will be released at a later stage, even though how much longer is not specified.

### A Fourth Form

An interesting feature of the report is the revelation, for the first time, of the existence of a fourth form of penicillin, known as K-penicillin. The existence of three forms, known in this country as I, II and III, and in the United States as F, G and X, has been generally known for some time (see Progress Reports in this journal). Chemists generally will welcome the possibility of ascribing definite formulæ to these forms, previously identified only by rather uncertain differences in their biological properties.

To clarify this particular point and the following account, it may perhaps be as well to begin by stating the two alternative formulæ now most generally proposed for penicillin.

The molecular formula—best deduced from analysis and molecular weight determinations of the sodium salt and methyl ester of penicillin II—is  $C_{16}H_{11}O_4SN_2R$ . Structurally this is represented by the formulæ A and B below; of these A is probably the most satisfactory.



Of these, A represents a  $\beta$ -lactam and B is described as an incipient azlactone. The four forms of penicillin are distinguished by the nature of the radical R.

In penicillin I (or F),  $R = \Delta^2$ -pentenyl.

In dihydropenicillin I,  $R = n$ -amyl.

In penicillin II (or G),  $R = \text{benzyl}$ .

In penicillin III (or X),  $R = p$ -hydroxybenzyl.

In penicillin K,  $R = n$ -heptyl.

Degradation products containing the R grouping fall into a similarly named and constituted series.

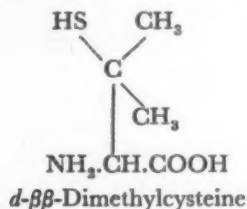
The penicillins are strong monobasic acids whose  $pK$  is about 2.8. Electrometric titration reveals no basic group, though the presence of one such group is disclosed by slow titration with perchloric acid in acetic acid solution. This process destroys the activity of the penicillin, and it is probably the basic group of penicilloic acid (see later) which is here being titrated.

A very valuable approach to the identifica-

tion of the structure of the penicillins has been by x-ray crystallography of penicillin derivatives. For the complete analysis the rubidium salt of penicillin II was used, the heavy rubidium atom providing the necessary reference point for interpreting the diffraction pattern. The similarity in the location of the scattering atoms relative to each other in the two postulated structures A and B, however, makes it impossible to distinguish between them with certainty by this method.

### Penicillamine

One of the most important degradation products of penicillin is an acid named penicillamine. It is obtained by treating either penicillin I or penicillin II with hot dilute mineral acid. It does not contain the R group; it has been identified by analysis and synthesis as *d*- $\beta$ -dimethylcysteine.



It will be remarked that penicillamine belongs to the "d" or unnatural series of amino-acids. Penicillamine has been synthesised and resolved; many derivatives of both the racemic and the resolved form have also been prepared. These include penicillamine disulphide (tetramethylcystine) and penicillaminic acid (dimethyl cysteic acid). A long series of thiazolidines and S- and N-substituted derivatives have also been synthesised. It may be remarked that, quite apart from its obvious importance in relation to penicillin, this work is a valuable contribution to organic chemical knowledge.

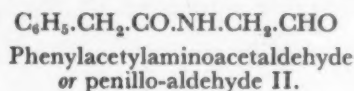
### Penillo-aldehydes

Besides penicillamine, acid hydrolysis of the various forms of penicillin yields a series of substances known as *penillo-aldehydes*, isolated as derivatives with dimedone and finally identified conclusively by analysis and synthesis.

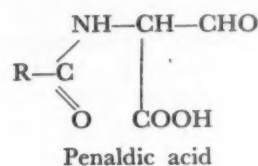
(a) Penillo-aldehyde I, derived from penicillin I, is  $\Delta^2$ -hexenoylaminoacetaldehyde.

(b) Dihydropenillo-aldehyde I, derived from dihydropenicillin I, is *n*-hexenoylaminoacetaldehyde.

(c) Penillo-aldehyde II, derived from penicillin II, is phenylacetylaminoacetaldehyde.

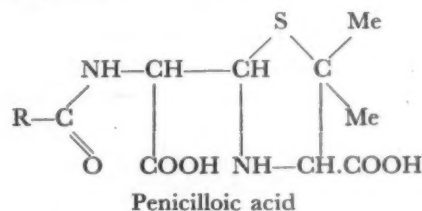


A third product of acid hydrolysis is carbon dioxide. It was considered very probable that this resulted from an unstable carboxyl group formed during hydrolysis. On this assumption a probable precursor would be a penillo-aldehyde-carboxylic acid, or *penaldic acid*. This assumption was conclusively proved. Penaldic acids have the following general formula:



### Penicilloic Acid

Alkaline hydrolysis of penicillin yields salts of penicilloic acid, in which the second carboxyl group liberated in the penaldic acids is present, but the molecular splitting produced by acid hydrolysis does not take place. Synthesis has shown that penicilloic acids are thiazolidines with the general formula:

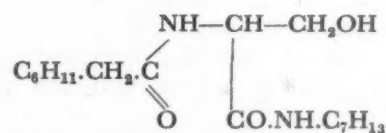


Penicilloic acids probably also result from the action of penicillinase on penicillin.

### Chemical Nature of Penicillin

It will be seen that the study of the products of acid and alkaline hydrolysis alone goes far to define, within quite narrow limits, the chemical nature of penicillin. There is, however, much confirmatory evidence for the formulæ originally postulated.

One molecule of penicillin II and two molecules of benzylamine combine to give a crystalline product,  $\text{C}_{30}\text{H}_{36}\text{O}_4\text{N}_4\text{S.H}_2\text{O}$ , the monobenzylamine salt of a dicarboxylic acid. By degradation with mercuric chloride this substance yields penicillamine and penaldic II acid benzylamide. The latter was catalytically reduced to hexahydrophenylacetylserine hexahydrobenzylamide.

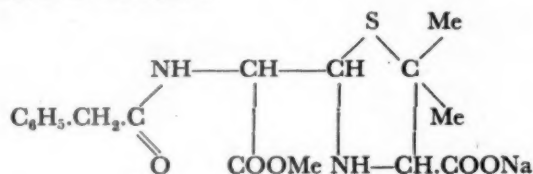


Hexahydrophenylacetylserine hexahydrobenzylamide



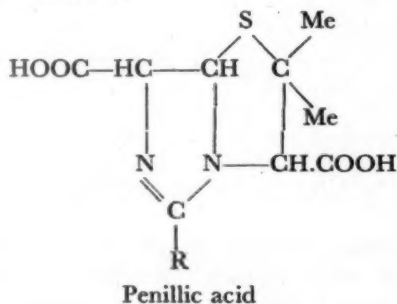
This substance was identified by comparison with an authentic specimen.

Inactivation of penicillin by methanol and to a lesser extent by other alcohols was noticed at an early stage in the investigations at Oxford. It has now been established that the inactivation is due to the formation of methyl esters. The product obtained by inactivating penicillin II with methanol was degraded to methyl penicillate II; the constitution of the latter was proved by reduction, when a product was obtained which was proved identical with N-hexahydrophenylacetylalanine. Sodium penicillin II inactivated by methanol has the following structural formula:

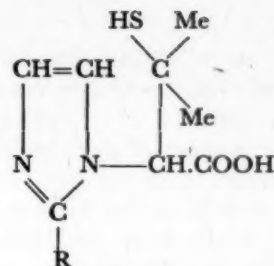


Methyl esters of penicillin can be prepared by the action of diazomethane; by treatment with mercuric chloride in aqueous solution they can be degraded to the methyl ester of penicillamine. This reaction is, of course, proof that the free carboxyl of penicillin is identical with the free carboxyl in penicillamine.

Treatment of any of the penicillins with dilute mineral acid at about 30° C. causes a molecular rearrangement, which can be followed polarimetrically, to give the isomeric penillic acids. Electrometric titrations show that these are dibasic acids, containing also one basic group. They contain no thiol group. The penillic acids are presumed to have the following structural formulæ:

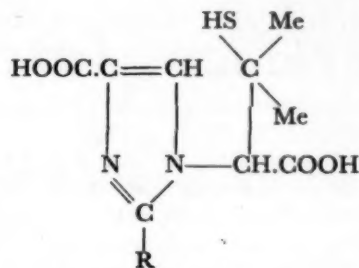


On treatment with cold aqueous mercuric chloride penillic acids are converted into penillamines, with loss of a molecule of carbon dioxide. The penillamines are mono-acidic, monobasic, and contain a thiol group. They are resistant to hydrolysis and have the following structure:



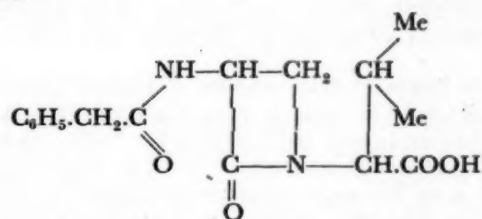
Penillamines

By treating penillic acids with baryta a further isomerisation takes place, yielding *iso*-penillic acids, to which the following structural formula is ascribed:

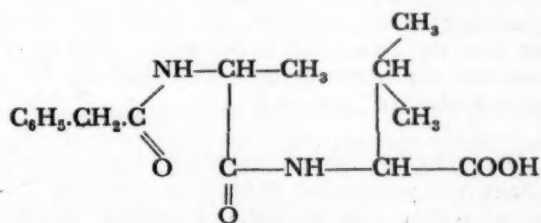
*Iso*-penillic acid

If penillic acids are hydrolysed with hot dilute mineral acid they yield penicillamine, penilloaldehydes and carbon dioxide.

The action of Raney nickel catalyst on sodium penicillin II has proved informative. The reaction products have been identified as desthiopenicillin II and phenacetyl-*l*-alanyl-*d*-valine.



Desthiopenicillin II

Phenacetyl-*l*-alanyl-*d*-valine

Certain reactions of methyl penicillin II have been closely investigated, with important results. By treatment with neutral mercuric chloride solution it is converted into methyl penicillenate II. On hydrolysis with dilute

alkali the latter yields the sodium salt of 4-hydroxymethylene-2-benzyloxazolone.

The reactions of the product obtained by adding the elements of thiocyanic acid to methyl penicillin have been studied closely and have resulted in much useful information.

From the work here outlined it will be seen that work on the synthesis of major fragments of the penicillin molecule is now well advanced. There remains, however, the formidable final

task of assembling these parts and establishing the structural formula of penicillin by a rigorous synthetic method. Beyond this is the possibility of adapting a synthetic method to the production of penicillin on a commercial scale. The number of research teams, both industrial and academic, investigating the problem and the many chemists of international repute associated with the work give promise that these remaining problems will soon be solved.

T. I. WILLIAMS.

## Pharmacy Internships

### HAVE ESTABLISHED THEIR WORTH

Hospital pharmacy internships have established their own worth, and they are in reality, forms of postgraduate work. For those who are considering a profession in hospital pharmacy, an internship is necessary to provide a sound working background. The primary objective of such an internship is to give the pharmacy graduate a basic pattern which will give him something to work with and to refer when he later takes the full responsibilities of a hospital pharmacist. As in graduate work in college, achievement here depends on the individual effort set forth.

In hospital pharmacies qualified to offer internships, the intern pharmacist is not a flunky nor an employee, but a student. Such pharmacies outline the year's work to include supervised experiences exemplary of those found in the practice of hospital pharmacy; among others, these include filling of hospital prescriptions and general ward requisitions, manufacturing, and hospital pharmacy administration. It cannot overemphasized that the practical experience must be supplemented continuously by intelligent use of reference books and journals.

One year becomes hopelessly short when one realizes the enormous volume of material to be covered within that period. However, much can be accomplished if the intern will approach each day with the thought that this is his year of grace, that the following year and thereafter, he will be entirely on his own; he will then not take so much

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for granted in the well organized pharmacy in which he is obtaining his experience but will endeavor to search out the reasons behind the routines currently in operation.

A number of pharmacy college graduates have completed internships and have gone into practice. Pharmacy undergraduates, in increasing numbers, are interested in working more closely with the medical world and are voicing a preference for hospital pharmacy. Concerning the latter, hospital pharmacists who have completed internships, and interns in training, should recognize the opportunity and responsibility for informing pharmacy students of the advantages of an internships in hospital pharmacy. Those who are interning at the present time will have problems due to variation in hospitals in which they are obtaining their experience. There is a wealth of information to share; for one thing, all are new in the field and for this reason, they are more keenly aware of pharmaceutical procedures and formulas which, perhaps not new to experienced hospital pharmacists, would be helpful to the inexperienced.

Pharmacy educators, pharmacy college students, and many hospital pharmacists would like to know more about hospital pharmacy internships. There has been little first hand information and undoubtedly, some misinformation regarding their scope and value. The most nearly accurate picture can be given only by those who have participated in such training.



## ORGANIZATION NEWS



S.E.H.P.A. MEETS IN ATLANTA 1946

The SOUTHEASTERN HOSPITAL PHARMACY ASSOCIATION held its first meeting since organization in Atlanta, January 19-20 with 46 members present. "Hospital Pharmacy Unity" was the subject of the evening speaker, Mr. Tom Reamer, Duke Hospital, Durham, North Carolina, representing the American Society of Hospital Pharmacists. After welcoming comments by President D. O. McClusky, Jr., Mrs. Irene Cook, vice-president, and Mrs. Anna D. Thiel, secretary, gave a brief history of the Southeastern Hospital Pharmacy Association.

Reports of the chairmen of the committees on membership, constitution and by-laws and professional information were presented at the morning session. A constitution was adopted and the following officers were elected as recommended by the nominating committee: President, John Zugich, Oak Ridge, Tennessee; president-elect, Mrs. Anna D. Thiel, Miami, Florida; vice-president, Mrs. Clara Green, Nashville, Tennessee; and secretary, Mrs. Evelyn Peacock, Atlanta.

Affiliation with the American Society of Hospital Pharmacists was decided by the group after a lengthy discussion, and the secretary was instructed to proceed with the preliminary work. John J. Zugich presented his viewpoint of the

John J. Zugich

Heads S.E.H.P.A.



National Health Insurance plan which has been conducted at Oak Ridge. This was followed by a group discussion of the various aspects of this type legislation. Mr. Rainey, editor of South-eastern Drug Journal, and Fred Walker, editor of Southern Hospitals, gave talks on the position of hospital pharmacy and the potentialities of this group. Also present at the meeting were Dr. R. C. Hood and Mrs. Hood and Dr. Minnie Meyer, all of Southern College of Pharmacy.

THE GREATER NEW YORK CHAPTER OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS held a meeting at St. Clare's Hospital, 415 West 51st Street, New York City, on Wednesday, January 16, 1945 at 2:30 P.M. Two new members, Sister Teresa, Seton Hospital, Spuyten Duyvil, New York, and Sister Dolorosa, Nazareth Branch of Seton Hospital, were welcomed to the group.

A lecture on the Therapeutics or Formulary Committee was given by Mr. Donald Clarke, apothecary-in-chief, the New York Hospital. His presentation included as its main topics, the composition, functions, meetings and authority of the therapeutics committee. Everyone considered this meeting most stimulating and instructive since Mr. Clarke was very generous in answering a number of questions.

The meeting adjourned about 4:30 P.M. after which Sister Donatus had the members meet Mother Alice, Superior at St. Clare's Hospital. The group also visited the pharmacy which is a complete and finely organized unit. The next meeting will be held at St. Vincent's Hospital in New York City on Wednesday, February 20th, 1946 at 2:30 P.M.



The MASSACHUSETTS SOCIETY OF HOSPITAL PHARMACISTS met at the Marine Hospital, Brighton, on January 16 at 3:00 P.M. Captain W. C. Teufel, commanding officer, gave the address of welcome after which the group inspected the Marine Hospital Pharmacy. "Something New in Enteric Coatings" was the subject of the talk given by Professor Charles W. Bauer, Ph.D. associate professor of chemistry at the Massachusetts College of Pharmacy.

Following the report of the nominating committee, election of officers for 1946 was held. Mr. Arthur Dodds, Lynn Hospital, was elected chairman; Miss Esther Clark, Springfield Hospital, vice-chairman; Miss Rose Tricomi, Newton-Wellesley Hospital, secretary; and Sister Mary Edward, St. Vincent's Hospital, treasurer. At the executive committee meeting which followed, the following committees were appointed: Program, A. M. Thompson, chairman, J. H. Murphy, and J. Chamberlain; membership, J. Barry, chairman, E. Clark and R. Tricomi; organization, E. Zola, chairman, F. Dondero and A. Johnson; minimum standards, D. Skauen, chairman, E. Hill, and A. MacDonald. The next meeting will be held on Wednesday March 20, 1946.

At its last meeting THE TOLEDO SOCIETY OF HOSPITAL PHARMACISTS voted unanimously to return the refund due it as an affiliated group, to the American Society of Hospital Pharmacists.

THE HOSPITAL PHARMACISTS OF CHICAGO-LAND elected the following officers for 1946: Chairman Miss F. Hatter, Chicago Lying-In-Hospital; Vice-Chairman Mr. H. Wilson, West Suburban Hospital; Secretary Sister Leonica, St. Mary of Nazareth Hospital, Treasurer Mr. H. S. Hansen, Grant Hospital; and Corresponding Secretary Mr. M. L. Hutton, Presbyterian Hospital. Mr. O. C. Durham, botanist of Abbott Laboratories, will speak on "Practical Aspects of Inhalant Allergy" at the next meeting to be held March 19 at 7:00 P.M.

George L. Phillips

Leads Ann Arbor

Hospital Pharmacists

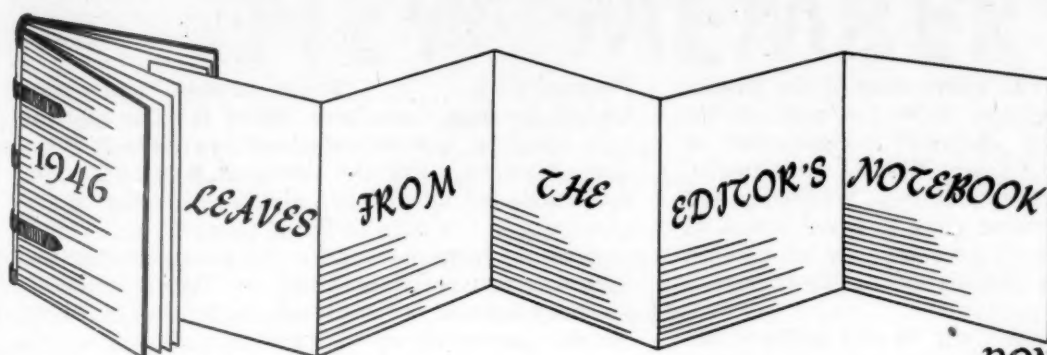


The ANN ARBOR CHAPTER OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS met February 4 at 8:00 P.M. at University Hospital. Mr. Paul Blower gave a talk on the accounting system used in the pharmacy at St. Joseph's Mercy Hospital where he is chief pharmacist.

During the business meeting the following officers were elected for the coming year: Chairman, George Phillips, University Hospital; vice-chairman, Paul Blower, St. Joseph's Mercy Hospital; and secretary-treasurer, Margie Lang, University Hospital. A tentative constitution was presented by the chairman of the committee on constitution and by-laws for discussion and suggestions from the members. Long range policy for the society was also discussed and a committee appointed to formulate long range planning. As an affiliated chapter of the American Society of Hospital Pharmacists, the group voted to return its refund to the national organization.

At a recent meeting of the BUFFALO CHAPTER OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS the following officers were elected for the coming year: Lynn Wile, president; Ethel Woodward, vice-president; Mabel Starr, treasurer; and Francis X. Sturner, secretary.

The secretaries of the local groups of the American Society of Hospital Pharmacists are asked to send an account of the chapter meetings to the editors for publication in the Organization News of THE BULLETIN.



DON E. FRANCKE

January 1 . . . . . Today the New Year -- but must hurry to finish our last issue for 1945. After a full day's work collating the loose ends of gathered material with Associate Editor Gloria Niemeyer we call it a day at 11:00 P.M. having finally assembled the proof to be taken to the printers. Dislike though we do to have the publication come out so late -- something always seems to happen to cause delay.

January 5 . . . . . This evening looking over a proposed cover design for the 1946 Bulletin. Within the narrow scope of the budget the editors are striving constantly to improve not only the appearance of your publication but also its contents.

January 10 . . . . . Conferring with Gloria Niemeyer on the editorial plan for 1946. She will write the column on "Therapeutic Trends," to be comprised of succinct descriptions of the newer drugs being used. Also proposed is a section on activities in the field of public health which are of interest to the hospital pharmacist. More articles on new drugs are also planned. We would like to give the members of the society the type of material they want and can use -- we wish they would let us know what these things are.

January 18 . . . . . Elated to hear that the Civil Service Commission has reversed its previous position and will now require graduation from a four year course in pharmacy for pharmacists entering government service. The Civil Service Commission was forced to reverse its stand because of a provision establishing a Department of Medicine and Surgery in the Veterans Administration which requires that pharmacists appointed in the Veterans Administration must hold the degree of bachelor of science in pharmacy. We feel that a great share in this victory rightly belongs to

able A.Ph.A. secretary, Robert P. Fischelis for his work in maintaining close contact and obtaining the understanding and cooperation of those in the Veterans Administration. This is an example of the priceless service the A.Ph.A. does for American pharmacy.

January 29 . . . . . Today a telephone call from Treasurer Sister Mary John. Glad to hear that she has forwarded her manuscript describing her splendid department. Discussing with her the question of refunds due the Ohio groups, decide to mail a check for \$50 to the Ohio Society of Hospital Pharmacists and one for \$50 to the Cleveland Society of Hospital Pharmacists. Since Ohio has two large groups with an overlapping membership, duplicate refunds to each group must now be made for many members. Thus a member of the Cleveland Society is automatically considered a member of the Ohio Society and a dollar refund for each member is due each organization. The one dollar remaining for the national Society is obviously insufficient to meet its current publication expenses. However, the total refunds will be paid as soon as possible and we do appreciate the patience and understanding shown by these organizations.

February 2 . . . . . Today plans for an extensive membership drive take shape. A note sent to Geraldine Stockert, chairman of the membership committee asking for a letter of invitation to be included in the next issue of our publication. Hope to send sample copies of the Bulletin with the letter of invitation to more than 2,000 non-member hospital pharmacists in the United States, its Territories and Possessions, and the Dominion of Canada. A big job will be to get the envelopes addressed, however, a still greater job will be to check each name of various mailing lists against our membership file.

February 8 . . . . . The addressing of the envelopes for the membership drive is well on its way. Thanks to the splendid cooperation of pharmacists Phillips, Lang, Gluck, McConnell, Baker, Siler, Hancock, Chiba, Williams and Niemeyer, each of whom gave several hours of their leisure time to a task that by no stretch of the imagination can be called "stimulating."

February 16 . . . . . A long newsy letter from Ted Spease, former dean of pharmacy at Western Reserve University and implementor of the present Minimum Standards For Hospital Pharmacy as adopted by the American College of Surgeons. Dr. Spease has accomplished a great deal for hospital pharmacy and he is still vitally interested in its success.

February 18 . . . . . Happy news! A donor who prefers to remain anonymous contributed \$100 to the Society. He requested that we use the money to conduct an essay contest on hospital pharmacy. Hope that many hospital pharmacists throughout the country will compete. This should be a good opportunity for affiliated groups to encourage some of their members to submit a manuscript. For those who believe two heads are better than one - they might choose a collaborator and submit a paper under dual authorship.

February 23 . . . . . Learned today that we would be unable to obtain the proper paper stock for the new cover design and that also we would have to get along with a different quality paper for the inside pages. This was disappointing news since the design was made to be printed on a hard glossy surface so that all elements would appear to the best advantage. It will be difficult to obtain sharp photographs on a dull finish paper.

February 25 . . . . . After a long delay caused by need to push our hospital formulary to completion, plans for the Institute on Hospital Pharmacy begin to take shape. Prepare a daily, hour by hour schedule listing the speakers, their topics, the chairman for each day and the chairman for each panel discussion. The first morning of the institute will be devoted to registration and a tour of the hospital and pharmacy department. On the first afternoon there will be three lectures, followed by a social hour in the evening. During the second, third and fourth days there will be five daily lectures or demonstrations followed by a panel discussion in the evening. After the fifth days' lectures there will be a final dinner with an award of certificates to those who attend all sessions.

February 26 . . . . . Today several hours spent trying to make available dates for the institute and rooming accommodations available at those dates dovetail. For the last week in June accommodations for only 50 are available at the Michigan League. A trip to Saint Joseph's Convent to secure accommodations for Sisters proved futile--their quarters will be filled by Sisters attending summer school. A call from the School of Public Health informing us that the large room we had our eye on for our general meetings would not be available.

February 27 . . . . . Finally found a dormitory with plenty of single and twin-bed rooms to house those attending the institute. There will be a block of rooms reserved for Sisters--from whom there have been many inquiries. Since the dormitory will be available only after the end of the spring term, the institute must be held later than we had planned originally. A call to Dr. Fischelis in Washington confirms the date as satisfactory and if no other changes occur the institute will be held July 15 through the 19.

February 28 . . . . . Sent a letter to Dr. Hugo Hullerman at the American Hospital Association giving in detail the hour by hour suggested program for the institute and suggested members of the institute faculty. Most of the material had been discussed with the Executive Committee as well as with Dr. Fischelis and Dr. Hullerman. As the next step Dr. Hullerman will invite the faculty to participate and after receiving their acceptance the programs and application blanks will be printed. Dr. Hullerman will handle all applications for attendance at the institute from the offices of the American Hospital Association, 18 East Division Street, Chicago 10. As soon as the programs are printed each member of the Society will be mailed one.



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8002  
Chica

J. R.  
Ches  
West

Lloyd  
Memo  
Spring

Morr  
Metro  
Welfa

Sister  
Nazar  
New

Wm.  
Chris  
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Mrs.  
1501  
Chica



# NEW MEMBERS

33

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Cooper Hospital  
Camden, New Jersey

Kate Matthews Whitefield  
Provident Hospital  
Chicago, Illinois

Lloyd E. Coffman  
Memorial Hospital  
Springfield, Illinois

Warren E. McConnell  
University Hospital  
Ann Arbor, Michigan

Sister Joseph Wilfrid  
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Vancouver, B.C.

Morris Dauer  
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Welfare Island, New York

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Brother Hugh Miller  
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Elizabeth, New Jersey

E. R. Wilson  
West Suburban Hospital  
Oak Park, Illinois

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Christ Hospital  
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Sister Margaret Ann St. Joseph's Hospital Louisville, Kentucky	Pfc. Paul Francis Brown AAF Regional Hosp. Pharmacy Maxwell Field, Alabama	Jennie Cutler Orange Memorial Hospital Orange, New Jersey	Thomas A. Foster 4842 Bradley Blvd. Chevy Chase, Maryland
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Joseph A. Barry Memorial Hospital Worcester, Massachusetts	Sister Mary Cecilia Schreuer St. Mary's Hospital Jefferson City, Missouri	Mary C. Dominguez DePaul Sanitarium New Orleans, Louisiana	Louis Gdalmann St. Luke's Hospital Chicago, Illinois
Irwin A. Becker Evangelical Hospital Chicago, Illinois	Joseph K. Chamberlain New England Deaconess Hosp. Boston, Massachusetts	Frank E. Dondero 6 Regent Road Belmont 79, Massachusetts	Sister Mary Georgiana St. Francis Hospital Blue Island, Illinois
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Sister M. A. Blanchette St. Peters General Hospital New Brunswick, New Jersey	Esther I. Clark Springfield Hospital Springfield, Massachusetts	S. Bruce Edwards U.S. Veterans Hospital Dallas, Texas	Anita Gluck University Hospital Ann Arbor, Michigan
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Paul G. Bjerke Luther Hospital Eau Claire, Wisconsin	Rudolph Cortesi Worcester City Hospital Worcester, Massachusetts	Sister M. Fidelis R.S.M. Saint Catherine Hospital Omaha, Nebraska	Sister Miriam Hall St. Rita's Hospital Lima, Ohio

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Tulare, R.R. 3, Calif.
- Betty Ann Hancock  
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- Hans T. S. Hansen  
Grant Hospital  
Chicago, Illinois
- Florence Hatter  
Chicago Lying In Hospital  
Chicago 37, Illinois
- Charles R. Hay  
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North Manchester, Indiana
- Carl Henry Hergert  
Binghamton State Hospital  
Binghamton, New York
- William J. Herman  
Dunham Hospital  
Cincinnati, Ohio
- Ray Hersh  
Toledo Hospital  
Toledo, Ohio
- Albie Cathryn Hervert  
2510 P St.  
Lincoln, Nebraska
- Eden Pearl Hewitt  
Doctor's Hospital  
Omaha, Nebraska
- Edith Hill  
New England Deaconess Hosp.  
Boston, Massachusetts
- James S. Hill  
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- Mary Ann Hilt  
Richland Hospital  
Richland, Washington
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- Reid Merlin Hovey  
U.S. Marine Hospital  
Mobile, Alabama
- Richard William Huepenbecker  
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- Sister Joanna  
DePaul Hospital  
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- A. B. Johnson  
Mass. Memorial Hospital  
Boston, Massachusetts
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- Hunter L. Kelly  
Watts Hospital  
Durham, North Carolina
- Sister Mary Oliver Kelly  
Mercy Hospital  
Chicago 16, Illinois
- Armen T. Kirk  
Boston City Hospital  
Boston, Massachusetts
- Estelle Kiszonas  
West Jersey Hospital  
Camden, New Jersey
- Leona S. Kopecky  
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St. Mary's Hospital  
Huntington, W. Virginia
- Rupert McHenry  
Conway Memorial Hospital  
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- Mary C. Maccarelli  
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Spartansburg, S. C.
- Alice L. Ritchie  
Christ Hospital  
Cincinnati, Ohio
- Sister Gladys Robinson  
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- Eldridge C. Ross  
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State T. B. Hospital  
Salem, Oregon

Frank J. Steele  
Greenwich Hospital  
Greenwich, Connecticut

Nathan Stern  
1656 East 19th St.  
Brooklyn, New York

Geraldine Stockert  
Monmouth Memorial Hospital  
Long Branch, New Jersey

Walter Webster Stone  
Municipal Hospital  
Tampa, Florida

Sister Laura Stricker  
U.S. Marine Hospital  
Carville, Louisiana

Mrs. Rebecca B. Strimel  
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Sister Gervase Sullivan  
Hotel Dieu Sisters Hospital  
New Orleans, Louisiana

Sister Mary Therese  
Mercy Hospital  
Altoona, Pennsylvania

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Easton Hospital  
Easton, Pennsylvania

Anna M. Varvas  
Burbank Hospital  
Finchburg, Massachusetts

Louis G. Vellella  
Grunow Clinic  
Phoenix, Arizona

Sister Mary Victorine  
St. Luke's Hospital  
Pittsfield, Massachusetts

Gerhard Waarvik  
Quisling Clinic  
Madison, Wisconsin

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John F. Wilcox  
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Dorothy L. Williams  
University Hospital  
Ann Arbor, Michigan

Edith Blanche Williams  
Bryan Memorial Hospital  
Lincoln, Nebraska

Ethel Woodward  
Childrens Hospital  
Buffalo, New York

Lee W. Wolfe  
Reading Hospital  
West Reading, Pa.

Edward J. Wolfgang  
Protestant Deaconess Hospital  
Evansville, Indiana

Eleanor Zmudzinski  
Glenville Hospital  
Cleveland 8, Ohio

The addresses of the following members have been lost and their mail has been returned without a forwarding address. If anyone knows the correct address of any of the following members, will you please send it to Secretary I. Thomas Reamer, Duke University Hospital, Durham, North Carolina.

Elizabeth Gene Brown  
Amos L. Kroupa  
Elve Louise Newman  
Richard Vowles  
Marie E. Vacho  
Ethel I. Rosmuson  
Warren L. Delaney  
Lt. John A. Gehrm  
Lt. Dorothy C. Parsons  
Forrest P. Barnes  
Margaret L. Norris  
Doris Jane Vermilyea  
James Kenneth Pearson  
Mrs. Myrbel N. Peterson